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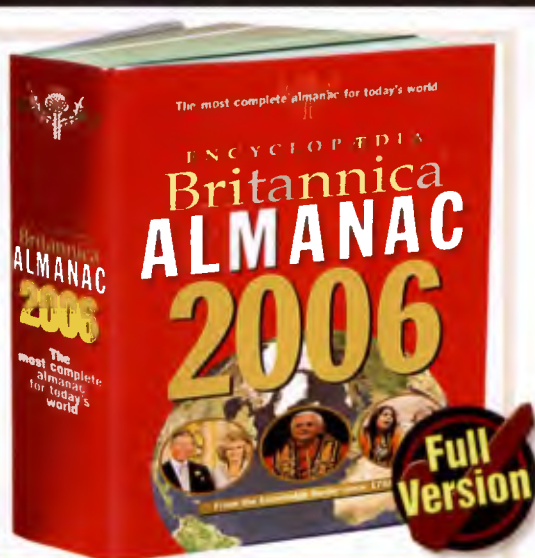


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Nick Race and Dan Chiappini test high-end performance PCs — and have a go at creating the fastest PC ever in our world record attempt.



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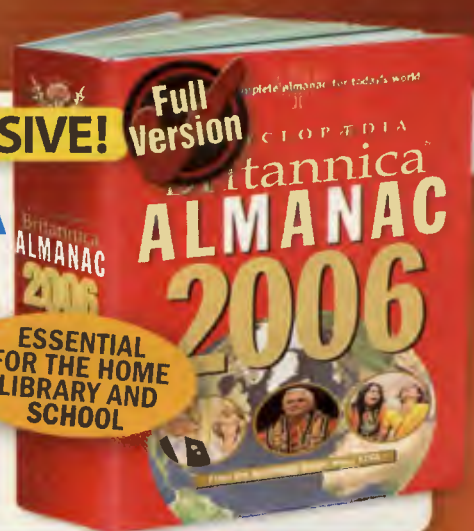
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TONY SARNO

The timing of the PC's 25th birthday on August 12 was perfect, because it seems that the 25th year is also marking generational change for the PC and its users. If you believe the anthropologists and ethnographers, those of you who grew up with desktop PCs and big Microsoft productivity apps are now the older generation, the "Desktop" generation. In the 25th year of the PC, those of you who can't remember a world before the internet are starting to take over and change the way we think about work and productivity — you are the "Interconnected" generation.

In fact, if the social networking revolution on the internet can be labelled as much a cultural revolution as a technical one, we might be seeing a re-run of the 1960s' youth uprising. If you're not constantly using web apps, conversing with MSN Messenger or hanging out on MySpace or Windows Live, you're technology's version of the 1950s generation: naive believers in the need for a 9-5 working day and happy to live your life in big desktop PCs behind firewall picket fences.

Worse, if you're an IT manager, you're at the frontline of the conservatives. You're the redneck cop with the baton trying to stop the free loving IM clients on your corporate networks. You're filtering or monitoring your staff's web access. You've banned MSN

Messenger because of its security risks. You're forcing employees to agree to the terms and conditions of use of the company computer system every time they sign on at work.

Until a few months ago, IT managers were the good guys, defending corporate networks against hackers and boosting staff productivity by monitoring internet use. What's going on?

Microsoft wants them to change their ways. At the recent Microsoft Tech Ed conference in Sydney, a Microsoft researcher said that unless employers let users surf the net at work, they were going to start losing them. Productivity in the internet age was not trying to enforce a 9-5 attention span at work, she said. It was about letting people do their thing as long as they turned in the work by deadline. This makes sense, but there's also an agenda.

To capture this new generation, Microsoft needs them using online applications that are the core of its web strategy, such as Messenger and new services such as Windows Live. There's only one hitch: the IT manager, the guy with the baton overseeing the network and preventing access to these services. So, the message to IT managers from Redmond (the new Haight-Ashbury) is to let your hair down and figure out ways of allowing the interconnected generation to do its thing. Should be interesting.

tsarno@acpmagazines.com.au



IF YOU'RE AN IT MANAGER, YOU'RE AT THE FRONTLINE OF THE CONSERVATIVES: THE REDNECK COP OF THE NETWORK

STAFF FILE

Name: Paul Schnackenburg **Age:** 38

APC job: Windows Server and server application specialist **Favourite movie:** *The Lord of the Rings*

Favourite author: Terry Pratchett (the *Discworld* series) **Favourite TV series:** *Star Trek* (what

can I say — it's the geek inside) **Dream job:**

Exactly what I'm doing: teaching, writing and IT consulting.

Paul started out as a building engineer but changed to an IT career, getting his hands dirty with DOS and Windows 3.1. He progressed to a CAD and network manager in his homeland Sweden. After sampling a few other roles in the IT industry, he travelled to Australia for a holiday,

met his wife and moved here permanently. He still misses the snow-covered nights and *real* broadband at \$55/month (no download limits).

However, enjoying his favourite pastime, nature walks, is a whole lot easier in the warmth of the Sunshine Coast. Paul's passion in life is teaching IT and he sees writing for APC as an opportunity to reach a "bigger classroom".

Paul also runs his own business as an IT consultant, focussing on small businesses with the primary platform being MS Small Business Server. It gives him a unique insight as a teacher and writer — using these tools in the "real world".

In his spare time Paul likes to have fun with his family and enjoys dabbling in multimedia, particularly creating 3D animation in 3ds Max.





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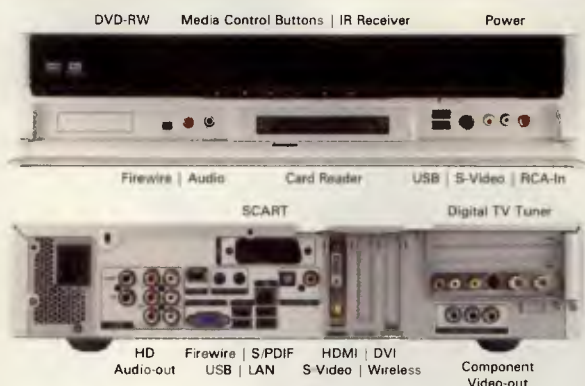


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Feedback forces Vista and Office redesigns

Release dates remain a moving target, but Microsoft says it is making many changes in response to beta tester feedback, *David Flynn* reports.

Microsoft has admitted that it has received strong feedback from beta testers on many aspects of Vista and Office, forcing some design changes late in the development cycle.

The soon-to-be-released RC1 builds of Vista and Office 2007 will reveal substantial changes from the widely distributed Beta 2 editions.

Jensen Harris, who leads the Office 2007 UI team, told APC that Office 2007 would receive a "technical refresh" for Beta 2 rather than an all-new Beta 3 release.

Some of Vista's "new" features have been resurrected from pre-Beta 2 builds, such as editing file properties in the Explorer's Details pane and a folder tree which remains available in all Explorer views. ZIP and CAB archives are now ranked with files rather than folders.

In addition to the Start button's basic Search field, users can right-click to access the more powerful (but still confusingly named) Search Explorer. The BitLocker hard drive encryption tool now has a friendlier front end, while Microsoft has calmed down Vista's annoyingly chatty User Account Control feature. Many of the persistent and nagging prompts seeded through the OS have been removed — and a "standard user" no longer requires elevation to lofty admin status to connect to a wireless network.

The Network and Sharing Centre has received a much-needed redesign to make it more task-oriented, while the sharing and networking control panels have been consolidated into a single applet.

As previously detailed on APCmag.com, the OS now sports a more polished blue theme for PCs lacking the graphics grunt to run Aero Glass.

Over in the paddock belonging to Redmond's other cash cow, the Office 2007 refit is mostly centred on the suite's radical new user interface.

Many beta testers have criticised the Ribbon device which merges Office menus and toolbars as being too large, too intrusive and too reliant on the mouse clicks — rather than the keystrokes favoured by power users.

New builds makes it easier and more obvious to minimise the ribbon so that only the names of each tab can be seen. Shortcut

keystrokes no longer cause the entire Ribbon to re-appear, as it does in Beta 2.

Frequently-used Save formats appear directly on the Save flyout menu under the Office orb, while a silver theme joins Office's slick black and 'Smurfette Blue' styles.



So you like cheap VoIP: how about free?

The Gizmo Project, a Skype competitor, has launched a promotion that offers free calls to landlines in 60 countries, including Australia.

You can even free-call mobiles in 17 countries (but not Australian mobiles).

The only catch is anyone you want to call free has to sign up for a Gizmo account and add their PSTN numbers to their Gizmo profile; a clear bid to grow marketshare of users quickly.

Meanwhile, internet telephony giant Skype is

feeling the pressure to open up its platform to competition and make its protocols more freely available for integration into devices, following Chinese hackers reverse-engineering the Skype protocol.

Gizmo already uses the industry-standard SIP protocol for its calls, and though it comes preconfigured to use its maker's SIPPhone service,

it can now hook into any Asterisk VoIP server as well.

Gizmo includes some worthwhile features that are extra-cost add-ons for Skype, such as inbuilt call recording and voicemail. It's a free download for Windows, OS X and Linux from www.gizmo-project.com, so jump online and check it out!

Dan Warne





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October 1986

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"Our founder, Bill Gates, worked closely with Apple's founder, Steve Jobs, on the design and development of Steve's amazing new device.

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MICROSOFT GIVES AWAY VIRTUAL PC

Microsoft has weighed in to the operating system virtualisation scene, making Virtual PC 2004 free.

Microsoft has announced that it is giving away Virtual PC 2004 SP1.

The decision only affects the Windows version (Mac users still have to pay) and follows a decision made earlier this year to offer the server version of Virtual PC free.

The package is available to be downloaded from www.microsoft.com/windows/virtualpc.

Until now there have been no free and unrestricted Windows desktop virtualisation packages available. VMWare made its server version available free of charge recently, but continued to charge for its VMWare Workstation product.

Microsoft has promised the 2007 version of Virtual PC will also be free and will be able to run Vista. Given Vista's heavy reliance on 3D GPU capability, this suggests that Microsoft may finally be implementing a level of 3D GPU emulation into VPC 2007.

Microsoft says it will allow Vista Enterprise edition users to install up to four copies of the OS in virtual machines, allowing for easier software compatibility testing and troubleshooting.

Virtualisation software is mainly used for consolidating multiple servers onto one high-speed PC, or as a testing

ground by developers who need to know if their programs will run on a wide variety of operating systems.

However, increasingly, it is being used by PC enthusiasts to test new (or old) operating systems or run multiple OSs concurrently.

Growing interest in virtualisation has fuelled the formation of a dedicated Australian/New Zealand Virtualisation Community (www.ozvms.com) by APC reader Damian Murdoch. Members can share tips and tricks and provide how-to's on virtualisation techniques with VPC 2004, VMWare, Xen and other VMMs.

Murdoch says the site is not a hardcore technical ghetto. Rather, the aim is "to provide the latest news when it is important and provide problem and solution articles that are written for beginner to intermediate level administrators."

Tim Gaden



Samsung's Vista drive unveiled: 4GB of Flash

Samsung's new 4GB solid state disk will act as a flash cache for Windows Vista, virtually eliminating hard disk seek delays.

Old-timers will remember the speed boost achieved by using a RAM disk with Windows 3.1. The new device works on a similar but far more advanced principle.

Coupled with Vista's "ReadyBoost" feature, the drive promises intelligent, pre-emptive caching. Samsung says that "it readies a user's favourite applications and data in the background, accelerating everyday actions... rather than being limited to 100-200 requests per second (as with a traditional HDD), Samsung's SSD can service up to 5,000 requests per second, virtually eliminating data seek delays."

Built-in 2x compression effectively doubles the functional size of the disk to 8GB, large enough to cache several substantial applications.

Because it drastically reduces the need for the hard drive to keep

spinning, the flash drive will also reduce power consumption by up to 90% in some cases, increasing the length of a laptop battery's charge by 8% to 12%.

In addition, Samsung suggests that the new drive will reduce boot times by up to 30% and reduce resume times after hibernation.

It will be offered in 2.5in and 1.8in sizes, both of which can be mounted in a 2.5in drive bay.

Pricing is yet to be finalised, although the rapidly falling price of flash memory makes a sub-US\$200 (\$260) price point likely. Samsung says it will charge only a small premium over the wholesale price of the memory itself.

Samsung Australia says that the company currently has no plans to release the device on the Australian market, but it will be available in the USA in early 2007 — around the same time that Vista is launched.

Tim Gaden



Ready in a flash: Samsung's new drive to eliminate delays?



PUSHING THE LIMITS

"Conventional PC/XT and AT-style machines limit software to 640K of memory, causing split spreadsheets, slow response times and major database limitations. The Intel Above Board is the solution to these problems. You can get up to 2MB of memory on one board, or 8MB with Piggyback Memory Board."



Designers lay bare sexier PC designs

Ice white is the new black, and beige is out of vogue completely.

Microsoft has hand-delivered a top-secret "industrial design" toolkit to 70 PC manufacturers in a bid to encourage the industry to make PCs that are "objects of pure desire".

In a move that shows the software giant is clearly paying close attention to growing interest in Apple's iPod and sleek PC designs, Microsoft has had 20 designers working full-time for 18 months on concept case designs that have a look and feel that complement Vista.

BusinessWeek in the US, which was provided details of the toolkit by an anonymous tipster, says even

Logitech was given a copy and encouraged to make peripherals that would match the look and feel of the PC designs.

A new Microsoft Design web site (www.microsoft.com/resources/)

TOP FIVE

The top five things Microsoft wants in your next PC:

- Accelerated curves
- Purposeful contrast
- Obsidian black
- Ice white
- Specific placement of power and reset buttons

design) doesn't give away many details. But it does say design director Steve Kaneko is tasked with "unifying the hardware and software industry to deliver an integrated, wired home — a prototype called the Microsoft Windows Home Concept. It will give people an end-to-end solution that integrates into every aspect of home and work life."

Microsoft Australia said it could not immediately comment on the contents of the Industrial Design Toolkit. However, the Microsoft Design web site says, "Like love, great Design requires no explanation."

Dan Warne



OOH, YEAH, STROKE MY WHEEL

Programmers may call their app "baby", but Microsoft takes computer love to a whole new level this month. Redmond spouted forth this gushing endorsement of its upcoming Office 2007 product: "People spend more time with Office than the love of their life. Since that's a big sacrifice, we want our customers to love using Office. . . we spend time listening, sharing, building relationships, generating innovative ideas and designing with our customers. The end result is software that our customers want to wrap their arms around and kiss." Don't believe us? Read it yourself at www.microsoft.com/resources/design/office.html. Coming soon: Windows Server 2007: the OS you'll want to book a room with.



Want to nominate a dumbest moment in tech? Send an email with the subject line "Dumbest Moments" to dwarne@apcmagazines.com.au. All correspondence becomes the property of APC.

FIVE NOT-SO-SEXY REASONS TO MOVE TO VISTA

Other than the perpetual "When will Vista finally ship?", the most common query I get is why anyone should upgrade to it. The far-and-away biggest reason, the Redmondians say, is improved security. My two cents? Even vastly better security isn't going to result in Vista flying off the shelves — virtual or otherwise. Sure, everyone wants more virus/phishing/malware protection built in, but security doesn't have that "wow" factor — it's expected and assumed. (And the true Vista security innovations, like BitLocker encryption, will be available only to the subset of users covered by Microsoft's Software Assurance licensing program.) There are other Vista capabilities, however, that could convince consumers and businesses to make the move. I don't share Microsoft's opinion

that things like the new desktop search or Aero Glass will woo the masses. Instead, here is my "Why Vista?" short list:

1. It boots faster. Mobile Vista PCs equipped with a hybrid "ReadyDrive" hard disk will be able to boot faster.
2. It launches applications faster. Vista's SuperFetch technology is designed to preload users' most commonly used apps into memory, making systems more responsive. A year ago, the Softies were quoting a 15% app-load-time improvement with Vista over XP.
3. It patches systems with fewer reboots. A year ago, MS officials claimed Vista would require 50% fewer patch-related reboots than XP.

If the company delivers even partially here, IT managers will rejoice.

4. It gets photo clutter under control. Windows Photo Gallery could bring order to the chaos that dominates many users' desktops.
5. It makes meetings less painful. There are a couple of unsung applets that Microsoft is embedding in Vista that demo really well. Meeting Space is a P2P program that allows users to hold impromptu conversations/meetings with up to 10 other Vista PC users at close range. And mobile or desktop Vista users can connect on the fly to network projectors.

If MS ever gets its Vista battery life and driver support stories in line, I'd add those to my checklist.

What about you? Is there anything in Vista that's got you itching to upgrade? Email: epinions@apcmagazines.com.au.



Mary Jo Foley is the editor of *Microsoft Watch* (www.microsoft-watch.com). She sounds off exclusively for APC on Windows each month.

WindowsWatch



quotefile

Finally, useful mobile web browsers

Mobile phone web browsers are getting serious, with huge steps forward in browsing, reports *Tim Gaden*.

Widgets on mobiles: here's one we mocked up in Photoshop earlier.



Remember you can now download the entire show on podcast. . . (or just do what you've been doing all year and pirate it on BitTorrent)

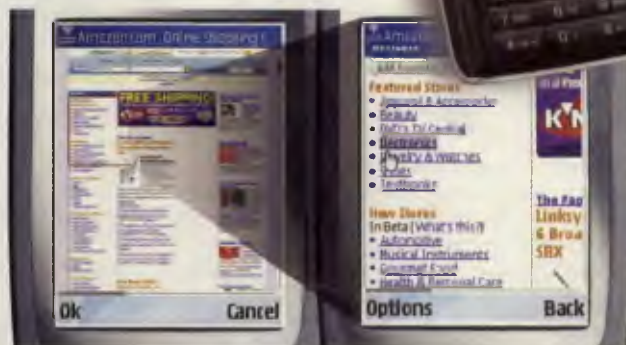
Andrew Hansen of *The Chaser* on the ABC's digital download strategy.

Symbian's brand-new browser (http://snipurl.com/u9dn) runs on Series 60 version 3 phones and comes pre-installed on Nokia E60, E61, E70, N71, N80, N91, N92, and 3250 handsets. It loads the whole web page just as it would display on a full-size computer monitor, and a scrollable selector lets the viewer pan around the page, viewing one section at a time.

An on-screen mouse pointer, controlled by a five-way button allows interaction with the web site in a more familiar way than previous mobile browsers.

The browser also benefits from full-strength page rendering: it is based on the WebCore and JavaScriptCore, open source components that are used by Apple's Safari browser. These components in turn were based on KDE's Konqueror open source project.

However, Symbian Web Browser's downfall is that it still requires "desktop-sized" data transfer. Pulling down full-size pages can run into hundreds of



Symbian browser: first you see the whole page (but can't read it); then you don't (but can read it).

kilobytes per page and is slow and expensive on GPRS.

Competing for mobile users' affections, Opera Mini is a tiny Java-based browser (100KB), free to download and compatible with most handsets. Instead of loading the full page, Mini pre-processes the pages on Opera's servers, stripping out bandwidth-sucking images, flash and video. The end result is resized to suit your screen's resolution, compressed and then piped to your screen.

You don't see what the web designer intended, but you save time and download quota.

Widgets may be the next thing to appear on mobile phones. Opera CEO Jon von Tetzchner told APCMag.com recently that his company is developing a mobile phone environment called Opera Platform, which will provide the whole user interface for next-gen handsets and allow the display of small web apps written using standard web languages like Ajax.

Dream System

Google's new server farm

In the battle of technology giants, Google shows no sign of surrendering to Microsoft. Deep in the backwoods of Oregon, Google is building a computer farm that will be able to match the hardware specs demanded by Windows Vista. . .

Actually, no-one knows exactly what Google is building at its new data centre on the Columbia River in The Dalles, Oregon, but it will be a dream system to die for.

The site, codenamed Project 02, sprawls over three acres and includes two aircraft hangar-like structures to house the servers and two three-storey-high cooling towers to dissipate the enormous amount of heat the server farm will generate.

Of course, dream systems are always expensive and this is no exception. Google has spent up big on peripherals. It bought a nearby hydro-electric dam to power the data centre and has



also snapped up the USA's largest dark-fibre cable network which runs alongside the river.

The hangars will be home to a substantial portion of Google's ever-growing pile of servers. In 2001, the company had just 8,000.

Estimates put the current number at 450,000. Imagine a LAN party involving the entire population of Geelong or Ipswich. Then imagine that there's plenty of room still to spare. No wonder house prices in The Dalles have shot up by 40% this year alone.

Tim Gaden

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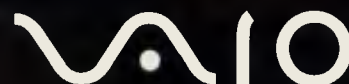


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Pick a Vista, any Vista

What's with the multitude of Vista versions? David Flynn looks into the confusion surrounding Microsoft's forthcoming OS.

Microsoft is planning to release eight versions of Vista. That's right: eight. It's a bewildering prospect and a situation unique to Microsoft.

Apple certainly hasn't suffered from offering Mac OS as a single package, and the relatively rare instances of dual Linux distros (such as Red Hat Enterprise Linux and Fedora Core, or Novell's SUSE and openSUSE) are primarily to split the community and commercial products.

Yet once Bill Gates, Steve Ballmer and newly minted Windows chief Steve Sinofsky all sign off on Vista's mammoth codebase, eight builds of the long-awaited OS will trundle down the line.

There'll be **Windows Vista Starter Edition**, a pared-back build aimed at "developing countries" with older hardware and a higher propensity to run a lightweight Linux distro.

Like the current XP Starter Edition, it doesn't support home networking and allows for only three applications or windows to be open at any one time.

Windows Vista Home Basic, like its XP Home Edition counterpart, will be the most common entry point for mainstream personal users. While it's got most of what the average user could expect, there's plenty of controversy surrounding the cut list. DVD burning, the DVD Movie Maker app and the Aero Glass GUI are all missing in action. Yet DVD burners are already standard kit on every PC this side of a two-dollar shop. And even some integrated graphics chipsets — such as Intel's 945G/GM Express and Core 2 Duo 965 Express, and ATI's RS400 and RS480 — have the necessary WDDM drivers to deliver full Vista bling on a budget, provided they're partnered with 1GB of RAM. This seems like a fairly arbitrary exclusion — and one we're certain that tweekers will quickly deal with a little registry mischief.

Acts of digital delinquency aside, the sleek Aero Glass GUI will make its debut in the

Vista Home Premium box, alongside support for tablet and media centre hardware and ad hoc wireless networking through Windows Meeting Space.

Windows Vista Business, as its name indicates, puts the business user in its crosshairs, with support for remote desktop, faxing and offline files and Windows Web Server. Tablet PCs are supported but not Media Center hardware.

In EU countries Microsoft will also offer **Home Basic N** and **Business N** editions. These are almost identical to the standard versions, except they ship without Windows Media Player (as part of the sanctions brought against Microsoft in 2004 for violating anti-trust laws).



ON THE SHELF, CONSUMERS WILL BE FACED WITH ONLY FOUR BOXES — HOME BASIC, HOME PREMIUM, BUSINESS AND ULTIMATE

There's also a superset of Vista Business called **Vista Enterprise**. This adds BitLocker drive encryption, a single-session version of Virtual PC (known as Virtual PC Express) and support for Microsoft's multi-lingual user interface to allow per-user setting of a different language for menus and dialog boxes.

At the top of the Vista version tree sits **Vista Ultimate**. This rolls together every feature in Home Premium and Enterprise to give you Vista with the works.

So — there's eight different versions of an OS which Microsoft said was all about delivering "clarity" to our world? Thankfully it's not quite that bad.

Consumers will be faced with only four boxes on the shelf — Home Basic, Home Premium, Business and Ultimate.

The two WMP-free N builds are for European eyes only, the Starter Edition is sold only in what the politically correct describe as "emerging markets", and Vista Enterprise is only sold through Microsoft's corporate licensing plans where rollouts deal in hundreds or thousands of users.

Even so, Vista's four "core" models are twice as many as for XP today and several industry experts told APC that they expect some consumer confusion, at least in the first months of Vista's life.

"I think that people are going to be a little confused initially around which products to get," predicts Nigel Gore, business manager for PC and Digital Display at Acer Computer. "The customer is going to see Vista advertised and think 'Great, I'm

going to get Vista', then walk into the shop and see Home Basic, Home Premium, Business and Ultimate. It should be a bit simpler from an OS perspective."

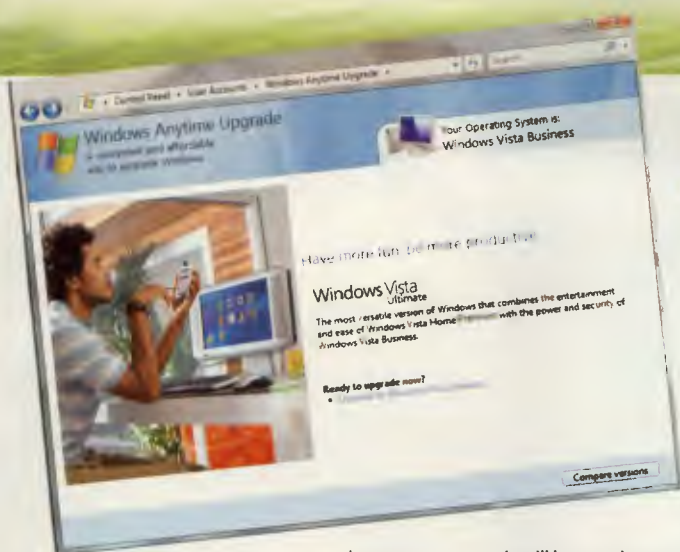
Rutland Smith, general manager for Computers and Communications at Harvey Norman, agrees. "Initially there will be some confusion, but I believe it will be relatively easy to clarify, like it was in the early days of XP".

Some of that XP exasperation stemmed from the fact that, at first, the boxes for both XP Home and XP Professional were blue in colour — the decision to make XP Pro green came later. It's an experience which Microsoft has learnt from, says Duncan McGilligan, the company's local consumer marketing manager for Windows.

"The Vista boxes will all be colour-coded. The traditional blue we'll keep on Vista Business. We'll



v1 v2 v3 v4 v5 v6 v7 v8



Unsure of which version to buy? Make sure you do your research first.

have two versions of green, a light green for Home Basic and a darker green for Home Premium, and Ultimate will be platinum. The boxes will also clearly communicate the features each one has — and tell people what purpose they're for".

Microsoft and its retail partners are also stumping up on ways to inform buyers on the retail floor.

Rutland Smith says that Harvey Norman will have "in-store displays to highlight the differences between Vista products and we're training staff up to help advise customers as to which version of Vista is most appropriate to their needs".

However, it's likely that shoppers will be steered — sometimes subtly, sometimes less so — in the direction of Vista Premium.

Microsoft's McGilligan expects that the lion's share of retail "will be shared between Home Basic and Home Premium," but says, "we're going to put most of our marketing efforts behind the Premium skew to emphasise its benefits. We'll be marketing all the cool functions and features of Vista. Certainly, the Premium builds are where you'll get Aero Glass and things people will see and want — and won't get if they buy the Home Basic version".

Dave Block, senior product manager for Windows Vista Marketing at Microsoft US, put it even more bluntly during a presentation to OEMs at this year's Intel Developer Forum. "One of our key goals is to drive the Premium skews," Block announced, identifying both Vista Home Premium and Vista Ultimate as the high-margin parts of the mix. "We want to hit a 50% run rate on Vista Premium in those first 24 months."

Block revealed that aggressive use of a "Designed for Windows Premium" logo (as compared to the regular "Designed for Vista" badge) on hardware, software and peripherals will push that demand.

"We're going to use that Premium logo as a call to action, whether it's on a software box or a personal device or a PC," says Block. "Our goal will be 50% of Premium logo systems and Premium logo devices (at launch)."

Acer's Nigel Gore suggests that shoppers may need a degree of *caveat emptor*. "There will be a

strong focus for the sales guys on the shop floor to identify which customer requires which particular version of Vista. That's where

it will be very important for the customer to understand their own needs. "The salesperson will say that you may as well go for the Home Premium version because you get all these added features, but if the user just requires it for home typing and email they certainly won't need Home Premium. The user needs to be doing a bit of research, going into the store and telling the salespeople their needs."

Gore told APC that Acer would be pre-loading versions of Vista onto systems based on price, specification and target audience. "Home Basic will be on sub-\$1,000 desktops and notebooks. This will be around 30% of our volume because we have some significant volumes below the \$1,000 price point. Home Premium is the sweet spot and where we'll be looking at around 50% of our volume, and that will be price points from \$1,199 all the way through to, say, \$2,499. That will merge with the Ultimate offering, which will probably be in the position of \$2,000 to \$3,000. Vista Ultimate will probably take about 10% of our volume, with the remaining 10% being Vista Business."

No matter which version of Vista they buy at the beginning, users will be able to upgrade to a higher build without adding another cardboard box to their collection. This hinges on the fact that no matter what version of Vista you get, the installation DVD contains images of all Vista editions — and in both 32-bit and 64-bit codebases, in the highly likely event that users step up from a 32-bit to a 64-bit platform sometime during the life of Vista.

"You can upgrade from your current edition of Vista to any higher edition simply by buying the relevant product key from a retailer or online," says McGilligan. He also told APC that changes have been made to Vista's media packaging to smooth the upgrade path.

"One statistic from the US is that 28% of helpdesk calls are from people who've lost their media or product keys, so we've improved the media packaging for the boxed product. It's a little bit bigger and a little bit cooler than a DVD slick, which is a complete change from the XP style of packaging. Hopefully people are less inclined to throw it away — so if they want to upgrade later on they've got the disk and product key right there."

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Livin' la vida Linux

Markus Rex was studying science at uni when a friend introduced him to a new OS called "Linux". Today he's CTO for Novell's SUSE. *Tony Sarno* reports on what happened in between.

Markus Rex is now the chief technology officer for Novell's SUSE, the version of Linux that's making an aggressive play for the corporate market. In other words, he's one of the few people standing between Bill Gates' Windows and complete domination of the corporate desktop. However, Rex didn't come to head up SUSE's development by a traditional rise through the ranks.

Appropriately for a Linux user, he first got noticed when he flamed SUSE staff, back when it was a small German software company that was driving the open source Linux project.

He recalled this when he spoke to APC in a visit to Australia last month to launch Novell's Linux Enterprise 10 OS. "I'd been using

SUSE since the second-ever release back in 1994, and often submitted patches and bug reports," he said.

"In mid-1998, I saw by accident that a couple of my reported bugs had not been fixed. At the time, I was having a pretty bad day and was in a bad mood. I wrote a nasty 'flame' email to SUSE complaining about it. In return I got a rather persistent job offer to join SUSE as QA to improve the quality of the product. After some more prodding, I joined in early 1999."

Three months later, an unexpected late-afternoon development meeting was called.

"We (meaning all 14 SUSE engineers) were told that the management structure would change and that the head of development, one of the four

founders, would step down. We were then told that I was selected by the founders to replace him.

"I looked as dumbfounded and surprised as everybody else in the room, as nobody had spoken to me before. My hand-over consisted of being told for five minutes, 'Markus, you'll be fine, don't worry'. Looking back on that sink or swim situation, I managed to swim. That period remains an unforgettable and exhilarating part of my experience."

Finding himself in charge of SUSE was as unexpected as getting into IT in the first place. Rex was born in Düsseldorf, but his parents moved when he was six months old to the Nürnberg area in northern Bavaria. Throughout his schooling, he

wanted to study physics. "Most fascinating to me was the area of particle and nuclear physics. I was also very impressed and influenced by some great physicists such as Feynman, Weinberg, Hahn and Heisenberg. I am not sure how their influence rubbed off on me though... perhaps it was Feynman's rather dry sense of humour which appealed to me. Other than that, it beats me."

"When the time came to decide what to study, I made up my mind to pursue the subject of material science as it was tangible and more interesting. Also, a close friend decided to study the same thing, which probably helped me cement my decision."

At uni, Rex had to finance his studies, so he started working IT



CUSTOMERS RARELY BUY AN OS BECAUSE THEY LIKE THE OS — MOSTLY THEY JUST WANT TO SOLVE SOME PROBLEMS

jobs — that's when he had his first major epiphany: observing Linux for the first time. "In November 1992, I was using OS/2 as my main OS. It had this cool UI, the Workplace Shell. I also used Windows 3.1 wherever I had to. One day a friend showed me something really cool. Using software called 'Linux', he could move a window around on the screen with the content still displayed and it even continued execution! A window showing a running MPEG still showed the movie while being moved. That was way cool, and I wanted it. So I started using Linux."

Once he joined SUSE, Rex got to devote himself to the mission of making the rest of the world see the power of Linux, driven by a desire to make it the best-engineered Linux of all. Understandably, when Novell came calling, he didn't know what to expect. Utah-based Novell was then a networking company with diminishing market share and was looking to reinvent itself.

"My first thought was, it was interesting, let's see what this brings. The second thought was that I didn't realise these guys were still around," he said. But unlike SUSE, Novell was big. Really big. It knew how to sell to and support corporate customers, and Rex came to see the possibilities.

"SUSE on its own would have had a very hard time developing a global reach," he said. "So, despite the fact that Novell had never appeared on the radar for Linux, I liked its sheer size. Also, being a techie, I liked the increase in sales staff to sell our fantastic product."

Now, three to four years after

the Novell takeover, Rex believes the Novell contribution has been instrumental in making SUSE a stronger proposition for companies. "With the offerings on top of the OS, Novell can deliver a far more interesting story than SUSE could. Customers rarely buy the OS because they like the OS, mostly they want to solve some problems," he said.

"Our focus on virtualisation with Xen was directly influenced by Novell's focus on systems management. Novell also had strong experience in this area." Virtualisation is a technology that helps improve server utilisation, a major attraction for customers.

"The second area [where Novell has helped] certainly is the push on the desktop. SUSE always had a focus here, but never had the means to do what Novell, Ximian (open source app developer bought by Novell) and SUSE together are able to deliver today."

Ultimately, Novell's major contribution was that it was a big software company and all that came with it. "Worldwide support, worldwide people on the ground and a strong balance sheet are all things Novell brought to the table. The question about [SUSE's] viability as a vendor finally disappeared."

If you're an operating system mogul in Redmond you probably have enough stock options to buy yourself a small country as a plaything. What does someone at the top of the Linux tree do to reward himself?

Rex, who has moved to Boston with his wife and 12-year-old daughter, says he loves to read and play his piano and, for special

occasions, takes his wife out to dinner in nice restaurants. "It has also been a lifelong dream of mine to get a pilot's licence and fly around in a small airplane. This year, after over 15 years, I finally decided to make the dream come true and started to take lessons! Hopefully this October I can finish my licence."

Ultimately, Rex is driven by a passion to make SUSE Linux the Linux that shouts technology leadership. "And I want it to be used. I travel a lot and it makes me proud to see ads from the companies that use our product. Sometimes when I'm sitting on a plane I look at the passengers and think that they are there because the airline we are on uses our product to run their ticketing system. That makes me proud."

Rex believes there are countless opportunities for SUSE to increase its foothold. "The constant changes around the next version of Windows gives us a great opportunity to get some people thinking. Also, with Linux now being an accepted OS, we can start arguing the business value that Linux brings. The increasing market share has Linux present on everybody's mind, so for both the server and the desktop we can win customers."

"Also, the incredible innovation and speed of Linux, which we fully exploit in SUSE Linux, brings us to areas we could not have competed in before. For instance, core data centre applications. With the experience and product portfolio of Novell, we can make SUSE the most usable, integrated and simply the best OSI!" **BTDE**



WHAT'S SUSE?

Announced "Susah" (not "Suzay", nor "Soos"), SUSE Linux is one of the main distributions of Linux. It comes in a full open source version (Open SUSE) and a version for corporate deployment with various Novell add-ins and developments (SUSE Linux Enterprise). Novell's goal is simple: create the best corporate OS, with features that enable it to power everything from servers to desktops and be easily installed and maintained centrally by IT departments. It also features advanced virtualisation, which improves server utilisation levels by consolidating multiple workloads on a single server or allocating a single workload across multiple servers. One of the main selling points of SUSE Linux Enterprise is that the OS itself is effectively free, customers paying instead for the service and support from Novell. This ultimately is a fraction of what a company would pay for licensing Microsoft operating system platforms, and is also the same strategy adopted by SUSE's main corporate Linux competitor, Red Hat.

APC has made available Novell's SUSE Linux Enterprise 10 on the cover DVD. It's the real deal. The full, unrestricted version as developed by Novell and featuring a new graphical interface and Xgl desktop effects. The support is extra.

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The virtualisation age

In a time where talk is cheap and hardware is too, the partitioning of resources through virtualisation is making a comeback.

Virtualisation is nothing new. It's had a home with mainframes since the '70s, when the consolidation of resources — running multiple “virtual” machines on the same hardware — was an important cost-saver. And in a primitive way, ever since the '80s, with Quarterdeck's Deskview (who also bought up QEMM-386, now that's showing my age), the desktop has been home to virtualisation as well. Deskview pretended to partition a machine to run multiple, concurrent, COMMAND.COM shells at the same time. Without a GUI, without a kernel — and before Windows 1.0 was even released. It was really just multitasking — but two or more complete and separate DOS environments could run.

Fast-forward a decade, and home and office users are used to having their Windows PCs be nothing more than a single unit. Why on earth virtualise it into two or more? But, depending where you worked, virtualisation on PCs was gaining traction — in 1998 VMWare released the first version of its Linux-based virtualisation software, followed soon after by its Windows counterpart. It wasn't the

first mainstream solution, but it quickly became the most popular. It found a home with developers, company helpdesks and plain, old geeks. It aided cross-platform development, allowed reversible sandboxed environments, let legacy applications run, or simply provided a means to run multiple operating systems on a single, cheap PC.

Linux, given its heritage, has been no stranger to virtualisation. BoCHs, Plex86, VMWare, QEMU and Xen are just some of the popular packages available today, many of which are cross-platform. But virtualisation as a desktop

the CPU onboard taking over some of these tasks is a huge boon to both performance and interoperability. In fact, it allows hosted operating systems to gain “native” access to the CPU, instead of a virtualised one. In an ironic twist, hardware virtualisation features take some of the virtualisation out of virtualisation (OK, I'll stop saying that word now, you get the idea!).

To be fair, some virtual machine software already does this (and is known as *paravirtualisation*), but requires modifications to the host OS. The popular Xen works this way and requires kernel level integration under Linux.

the operating systems themselves — especially as software is updated to take advantage of Intel and AMD's new CPUs.

The possibilities are exciting — why decide if you want to run Windows or Linux? Run both, side by side, at full speed seamlessly and separate. Don't like Linux? Run Vista and Windows XP together, in case you're not entirely happy about Vista's newness to the world.

But more than this is the future of applications — a popular example is to run a browser within its own virtual machine, completely separate from the main OS. It doesn't matter where you surf or



IT MAY SOUND SMALL, BUT THESE DEVELOPMENTS ARE A PARADIGM SHIFT IN HOW WE RELATE TO A SYSTEM'S RESOURCES

application, especially on Windows, has been largely a novelty. Until now, that is. This year, two key events happened that will re-define how we use our PC's resources in the future. Firstly, Intel and AMD announced hardware hooks for virtualisation, built into the CPUs themselves. Codenamed Vanderpool for Intel and Pacifica for AMD, Intel is already shipping CPUs with the new technology.

As virtualisation is all about partitioning and management of hardware resources to appear as individual, separate machines, it's no surprise that virtualisation software has overheads. So, to have

The second big thing to happen is Microsoft releasing its Virtual PC software into the wild, for free. This spurred VMWare to do the same, to stem a possible loss of market share. All of a sudden, quality, efficient virtualisation software is free for everyone.

It sounds like a really small thing, but these two developments represent a paradigm shift in how we relate to a system's resources. With enhanced OS support in the future — and Vista will be “enlightened” as to its presence in a virtual machine for better performance — virtualisation will become as commonplace as

what spyware and viruses you pick up along the way — when the browser is closed the virtual machine is killed as is any malware.

Or take it further still and run any application you choose, regardless of platform. Imagine launching a Linux application from Windows, with Linux itself running transparently in the background, seamlessly feeding the application to your desktop. Who needs to dual-boot at all? This is just the beginning.

And wouldn't that be a sight — a day when the operating system you choose doesn't matter, only the applications. [ETC](#)



LinuxWindow

by
Ashton Mills

Editor of the Linux Pocketbooks series, and more recently Atomic magazine, Ashton has been a tech journo for over 12 years, including five years with APC.



Republic of Gamers- CROSSHAIR MOTHERBOARD

Unique System Tweaking Features for
Building Powerful Gaming Machines

It's good to see ASUS launching a new product line, Republic of Gamers (R.O.G), dedicated to the gaming community. Gamers need their computers to be high performance as well as convenient and stylish, and that's where R.O.G comes in. To service this group of extremely knowledgeable users, R.O.G introduces its inaugural product, the Crosshair motherboard, which implemented some great features for both gamers and tweakers to build their dream machines.

Easy System Tweaking with Style - LCD Poster

Many enthusiasts and engineers install a debug card on the motherboard when making system adjustments and upgrades. The card issues a two-digit code for each process during system boot-up, and when the system hangs, the card will freeze to let you know which part of the system is responsible for the error.

LCD Poster, located at the back I/O of the Crosshair, displays the actual names of each boot-process instead of codes. And just like a debug card, when the system hangs due to faulty connection or configuration, the LCD Poster will freeze on the displayed process name that caused the hang up. There is no need to remember the different numeric codes.



Connect in the Dark - EL I/O

Today's gamers demand more than just good performance. They need features that are tailor made for their usage experience.

The Crosshair comes with EL I/O, an impressive feature that simplifies connecting devices by lighting up the back I/O panel for convenient connection in dark environments such as LAN Parties. Say goodbye to jamming devices into the wrong connectors and ports.

Performance and Reliability - 8-Phase EL Cap-less Power

It's apparent that the two main goals of the Crosshair are overclockability and reliability, and 8-Phase EL Cap-less Power is a brand new design that accomplishes exactly the goals mentioned.

It removed the bulky cylinder-type capacitors and replaced them with chip-style polymer aluminum electrolyte capacitors, which are used in server level systems, for better spacing and thermal environment. In addition, unlike the conventional EL capacitors, which are susceptible to leakage and blowups, the new design eliminates capacitor damages once and for all.

Sound with Clarity - SupremeFX and Array Mic

Sound also plays a big part in the overall gaming experience. The SupremeFX audio card included is designed to provide the best gaming audio platform. With 24bit/192kHz full sampling in all surround channels, whether you're hearing game actions through headphones or 7.1 surround speakers, all sound effects will be loud and clear.

The audio card is supplemented with the bundled sophisticated Array Microphone. While competing in game tournaments, the microphone receives only the sound coming from the reception cone and ignores the sound coming from other directions, canceling out a large number of interferences including neighboring speakers and reverberations. It also features "Echo Cancellation Technology", which eliminates the annoying echo during audio and voice applications.



Rich Software Bundle

The Crosshair bundles 3DMark 06 Advanced Edition. As you probably all know already, It is the most popular and authoritative 3D benchmark application used by professionals around the world.

The Crosshair packs a whole lot more. You can go to the ASUS website www.asus.com.au and check out other innovative features, including onboard LED, onboard switches, Q-Fan Plus and Q-Connector.

Lights, camera... action!

Vista adds some key features for movie makers and multimedia buffs.

Movie Maker 2.1 came bundled with Windows XP SP2. Under Vista, Movie Maker is bumped up to version 6.0 — a slightly confusing version change, but all it signifies is that the Movie Maker version is now tied to the Windows version (Vista is Windows NT version 6.0). The main difference with Movie Maker 6 is that it supports high-definition video and it can (finally) output straight to DVD. All the previous output options of saving to a media file, CD, email, web or DV camera are still available. And now onto some other new Vista features.

DVD MAKER

Windows DVD Maker is a brand-new addition to the Windows suite. As the name implies, it's designed to allow you to author and create DVDs. It doesn't have Movie Maker's capacity for capturing from video camera — rather, it's designed to take digital content like images and videos and author them into a standard DVD format. It supports both NTSC and PAL TV formats, as well as 4:3 standard and 16:9 wide-screen ratios.

The application uses a wizard-based interface, stepping you through each stage of the

authoring process. Images are automatically bundled into their own slideshow and the slideshow is stored and referenced as a DVD chapter. In fact, each piece of digital media you import is treated as an individual chapter or scene, and you can't break them down any further. If you want to get picky about being able to skip through video content using scenes, then you'll need to use Movie Maker to break down the content.

The slideshow functionality in DVD Maker is slightly more limited than Photostory, in that you don't have the fine degree of control in customising transitions and effects between images. However, there is a certain amount of customisation you can do, including adding background music to the slideshow, changing the default transition effect and whether to use the pan/zoom effect or not.

Photostory, as we currently know it, will not appear in Vista. Its functionality has been subsumed and split between Movie Maker and DVD Maker. So, for users who only want a basic slideshow, DVD Maker is the tool of choice, whereas those wanting a finer degree of control need to use Movie Maker.

The available themes are very impressive. They contain quite a lot of animated menus and transitions, using screenshots drawn straight from the imported content, and the end result looks highly polished and professional. Menus are customisable, allowing you to add foreground/background video or



Worth the wait: **Movie Maker 6 supports HD video and can (finally) output straight to DVD.**

menu audio, as well as customising fonts. Changes can be saved as your own brand-new style, for use in later productions. Microsoft has also released an SDK (Software Development Kit) for third party developers — so they write their own themes.

At any stage you can preview the DVD. This quickly renders what you've created so far and displays the preview as if you'd just inserted the DVD — all menu animations and content playback from start to finish. Hit Burn and the project gets rendered and dumped to DVD. Rendering time and burn time will

depend on the speed of your system and burner.

VISTA SLIDE SHOW

For quick picture slideshows which don't need to be rendered projects, Vista's "Slide Show" feature is a great way to go. Navigate to the folder containing the images you wish to display and hit the Slide Show button in the menu bar; the images are automatically preloaded into a picture slideshow. Slide Show doesn't support embedded music, but as it's all run from Explorer, start the music track up and commence the slideshow. [BTE](#)



HastalaVista

by
James Bannan

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Vista for you every month.

EVOL>E

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 **TDK**

Warped logic

Some end users may not know much about PCs, but this doesn't stop them being very "resourceful" and "technical" in their attempts to fix them...

We're generally understanding when end users have trouble with technology, but some people's lack of PC savvy can be mind-boggling, as the following APC reader submissions reveal...

So, let this be a reminder to us all: laptops and liquids do not mix."

LOVE'S LABOURS "LOST"

An endless source of despair for the tech savvy are less-than-savvy sales staff. Philip Hambling from Spring Hill, Queensland, visited a retail outlet to ask whether their scanners could easily scan images to produce JPEGs.

Salesman: Yes, but you do know that JPEG is a "lossy" format don't you?

Hambling: You mean — the compression causes a loss in picture quality?

Salesman: No — the quality deteriorates over time.

Hambling: (blink)

Salesman: (blink)

Hambling: Uh... what makes the quality deteriorate?

Salesman: Well, it actually depends on how often you view them — each time you view a JPEG the quality is reduced because of the compression.

Hambling: So, you're saying that when you view a JPEG file, the file gets modified. What if the file is read-only?

Salesman: Yeah — I don't fully understand how it works, but a mate of mine explained it to me. I've seen it myself.

Hambling: You've seen it yourself?

Salesman: I've got this picture of my ex-girlfriend and... I look at it quite often. Over the months I can really tell that the colour has faded and the detail isn't as good...

Not only was the poor guy pining for his ex, he clearly wasn't getting much (tech) support from his friends.

(And he didn't make a scanner sale either, notes Hambling.)

GETTING UP TO NO GOOD

One of the most common embarrassments faced by poor tech support folk is finding that the "slow" computer they have to fix is full of spyware and junk from porno sites (or worse — chock full of porn itself). But sometimes, the end user themselves is the surprise. Phil Fay, a computer support technician from Arundel, Queensland, recalls: "I was called out to a gentleman's home to fix his computer as it was doing 'funny things'. I found quickly that it was swamped with adware and a few non-lethal viruses. I noted that his favourites and history listed mainly adult sites and thought I should advise him that — if he was going to visit such sites — he really should get an antivirus installed, as these sort of sites are notorious for this sort of thing."

Fay says that as a technician, it wasn't his position to judge — he was just there to help.

"But then I then found out that although it was his computer, it was his teenage daughter that used it and he was not amused by my comment! 'Are you suggesting that my daughter is looking at pornography?' he asked. I was caught off-guard and had nowhere else to go but the truth. I said: 'I'm not suggesting it, mate. I'm telling you straight!' He paid me my money and kicked me out. Anyway, I just wanted to say 'sorry' to his daughter — whoops!"

WINNERS!

This month's published readers win a Microsoft Wireless Laser Mouse 6000 worth \$129.95. Made for desktop PCs, it features Microsoft's high-definition laser technology with ultimate precision and smoother tracking and responsiveness (even on unique surfaces). This mouse includes a new magnifier tool and a tilt wheel, making navigating, viewing and editing easier. The Microsoft Wireless Laser Mouse 6000 delivers more comfort and superior control to the desktop in a high-end style that will turn heads.



SEND US YOUR CONTRIBUTION AND WIN A PRIZE!

Send in your tales of woe involving dumb end users or incompetent techies to apcenduser@acpmagazines.com.au and if we print it, you'll win a prize. You must supply contact details in order for us to verify your contribution.

A LOAD OF HOT AIR

Matt Dunleavy from Sumner Park, Queensland, found that a user's fix was worse than the problem. He recalls: "A fellow staff member accidentally spilt a cup of coffee on their laptop. After several attempts to turn it back on without success, it was decided that it would be best to use a hot air dryer to dry the excess liquid off. This caused the keys to warp (see pic above). Now, not only does the laptop not power up any more, the keys are warped. The laptop cost over \$2,000 and has now been written off (it was deemed not worth fixing).



EndUser

from
The readers of APC

APC readers who deal with new computer users or incompetent IT administrators share their survival stories,

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Watchdog

eyes on vendors



The shape of things

When is a 64Kbit/s plan not a 64Kbit/s plan?

When it's a 28Kbit/s plan. Confused? So was APC reader Austen Evans.

A few months ago I was looking for a wireless internet solution and was directed towards an iBurst solution using Chilli (www.chilli.net.au) as the ISP.

I carefully read the pamphlet supplied in the store and chose Chilli for two reasons: firstly, it had no extra cents/megabyte charge after exceeding the monthly usage allowance; and secondly, after reaching the monthly usage allowance the speed is shaped to 64Kbit/s.

This was exactly what I required, as I frequently travel and was looking to reduce hotel dialup costs. Given that the maximum speed I typically connect to through hotel switchboards is around 45Kbit/s, having my connection slowed to 64Kbit/s after the included usage seemed like a great plan.

I discussed this with the sales assistant and he also agreed this would be a great plan for my circumstances.

However, I have now found out the hard way that while both the Chilli point-of-sale advertising and the Chilli web site have these plans, the actual plan you connect to is different and not mentioned at all.

It seems that after downloading 200% of your monthly allowance,

your speed is shaped to 28Kbit/s. Nowhere in the POS advertising or on the web site is this mentioned.

To play the devil's advocate, why would Chilli do this? What does its Acceptable Usage Policy state?

Clause 7 of the AUP says, "If you use unreasonably excessive resources on Chilli's Network and systems, your access may be suspended or terminated at any time, without notice."

So, given that I have used 1GB on a 200MB plan, is this excessively using Chilli's network or systems? One would hardly think an extra 800MB would be stretching its network resources given that it also sells 1GB, 2GB and 10GB plans.

The point remains that nowhere in its POS advertising or on its web site does the company mention this limit. I know how much I download and was perfectly happy to be able to do so at 64Kbit/s — but not at 28Kbit/s.

So what does Chilli management have to say? Basically, stop complaining or we'll terminate your account. . .

"According to our AUP, we are entitled to suspend/terminate your service but, as a courtesy, we simply rate-limit you down to 28Kbit/s.

Kind Regards,
Chilli Internet Solutions"

This is not acceptable, if Chilli wants to have a 28Kbit/s policy that is fair enough — but it must advertise this in its POS material and on its web site and not just lead people to discover that "shaped to 64Kbit/s" means "shaped to 28Kbit/s".

Your support in this matter would be appreciated.

Austen Evans
Hallett Cove, SA

Watchdog got in touch with Chilli to discuss Austen's issue — and were met with the following reply:

Dear Watchdog,

Thank you for the chance to respond to the reader's issue in relation to our "shaping" of his iBurst connection.

We do offer higher-usage plans and they cost more money. Our costs are related to the usage of our plans, and (no surprise) we charge more for higher-usage plans. If the APC reader wanted a 1GB plan, we would expect that he would order and pay for a 1GB plan. If he wants a 200MB plan, your reader quite rightly recognised that the plan would be limited in what it could do at usage greater than 200MB.

However, where a user actually takes 400% more than his agreed

plan, we believe he should expect other things to happen at that point.

Your reader is probably right that we should make that point more clear on our web site and we have clarified the text of the Acceptable Use Policy on our web site:

"The initial shaping will be to 64Kbit/s. However, if the customer's usage exceeds a further 50% of their data usage cap or 250MB (whichever is smaller), Chilli may shape much more aggressively (again reducing the effective data speed)."

We believe that our users are getting an excellent service. However, we do not particularly want users who want to pay for a 200MB plan and take 1GB worth of data. While there is nothing wrong with wanting that outcome, our network doesn't provide the ideal service for such a customer, so they are probably better off elsewhere.

We want all our users to have the experience they sign up for, and that also means ensuring that our network does not become overburdened by any particular customer operating outside their agreed plan limits.

Jeremy Tang
Marketing Manager
Chilli Internet Solutions

WARRANTY WOES

Ron Gully of Geelong West, Victoria, contacted Watchdog after a local computer shop's repair job on his PC went wrong.

A few months ago, his computer "began to spontaneously reboot", so Ron took it back to PCD International Pty Ltd in Geelong – the shop where he bought it 15 months previously.

The owner of the shop agreed to replace the motherboard with a "refurbished" ASUS P4S800s-X at the total cost of \$110 (parts and labour).

He gave Ron a nine-month warranty on the motherboard for good measure.

Once Ron got it home again, he discovered that the sound was not working. Also, every time he rebooted the machine told him that a new processor and hard drive had been fitted.

He got on the phone to the shop the next day. Ron was told that "the owner was away and would be back in a 'month or so' and that if I wanted a repair, because I was likely 'at fault',

I needed to pay for the repairs and then take it up with the owner."

Ron also contacted ASUS, who told him that it doesn't refurbish motherboards and that his "refurbished" one was most likely taken from another faulty PC.

Watchdog contacted the owner of the business, who told us the board was new, not refurbished. He was unable to explain the unusual warranty period listed on the invoice. It's probably a typo, he suggested.

However, he was very willing to set up a time for Ron to get his motherboard fixed. "I always treat my customers with respect," he said. "All they need to do is call and I will fix the problem, whatever it is."

If you have a similar problem and a vendor won't honour your warranty, contact the Consumer Affairs Department in your state (contact information is available online at www.consumersonline.gov.au/Content/Links/FairTrading.asp).

RESTORING THE FAITH

I have reached the end of the line with Sony. The company's support has been disgraceful.

Sonic Health Care recently purchased a Sony VAIO notebook (model VGN-SZ25GP) so that we could evaluate the performance on our corporate network. During this time we reformatted the laptop to meet our needs for medical purposes. During this procedure we needed to obtain some drivers and a manual only to find that these can not be downloaded in Australia and

that we would need to purchase a driver or restore CD from Sony.

Every other manufacturer in the world provides drivers and manuals on their web site (and as a result have happy customers by providing decent customer support).

We are about to purchase 40 laptops and I would prefer (as would the CEO and the finance director) that we buy VAIO laptops, but at this point I cannot say that I am in any way pleased with the level of support from Sony. I am hoping that you can provide us with some after sales support free of charge as Sony provide this to every other country except Australia. The option so far has been that we will need to buy a CD for \$55 from Sony to get the manual and drivers. I'm sorry, but this is not going to wash with

management and at this stage I will have no choice but to advise the go-ahead to be with Dell laptops.

Providing your customers with a manual and device drivers is no big ask.

Ian Macgregor
Macquarie Park, NSW

Dear Watchdog,

Thank you for your concern regarding Ian Macgregor's complaint. We have since been in communication with the customer and have assisted him in the recovery of his VAIO system and he is more than content with the outcome.

So you are aware, in the Operating Instructions that are shipped with each and every VAIO notebook, it is recommended that customers create a recovery disc as "making a backup of the recovery files can prove vital to the smooth operation of your VAIO computer".

In this instance, these discs were not created,

hence leading to the difficulties which the consumer encountered.

Sony Australia considers customer service an important part of its business and makes efforts to ensure that each and every service enquiry is dealt with in a timely manner, resulting in a favourable outcome.

Thanks and kind regards,

Alex Patterson
Customer Contact Centre
Manager, Sony Australia

Sony posted Ian a recovery CD. We asked the company about Ian's other questions. Sony only provides hard copies of the parts of the manual "deemed most important for the user (such as start up and recovery)". For environmental reasons, the rest of the manual is only provided in electronic form. Sony was unable to say why a recovery CD is not included with the laptop or whether the drivers for the VGN-SZ25GP would be posted on the Sony web site.



Irrecoverable: one reader's faith in Sony seemed gone for good, until they assisted him with his support issues...

watchdog@acpmagazines.com.au

Has an IT vendor or telco stuffed you around? Let us know about it and we will chase them for a solution on your behalf. Letters sent to watchdog@acpmagazines.com.au must include the writer's full name, suburb, state and phone number to be considered for print publication. Please also include details such as invoice numbers and the people you've spoken to. Phone details will not be published.



Epinions

have your say!



DO NOT COLLECT \$200

I read Blake Walters' letter in APC July (page 32) and found myself in full agreement. For all of Microsoft's issues, at least it backs its products with a full raft of support options — which are much harder to find for Linux. Each OS has its place, and until Linux evolves it will remain bloatware. On the topic of it-being-cool-to-put-Microsoft-down, I am always amazed by how double-faced the regulators are. Sure, MS might get up to some dubious behaviour at times, but I fail to see how that translates to limiting MS' ability to build anything it wants into its products. Do the regulators around the world tell Audi not to put 10 airbags in its cars because it would be unfair to Hyundai (who have none)? Of course not, because the commercial reality is that you as a consumer have choice. If you want Windows bundled with IE, buy it. If not, close your mouth and buy Linux or a Mac. It's that simple. The two-faced regulators want to have their Hyundai and their Audi airbags too!!!

Mark Cavanough
Moorebank, NSW

BACKED INTO A CORNER

As a generally satisfied user of the Microsoft Update, I appreciate the

convenience and basic ease of use that the service provides. My primary concern is the seeming absence of a means to back up these updates. I have contacted Microsoft's help desk to seek their advice and was told that the only option — if these updates were lost (ie. through reformatting the hard drive) — was to re-download them all over again. Now, the last time I had to do this there were some 87 updates to be downloaded and installed! That takes a heck of a long time and chews up my (limited) download limit. Microsoft tell me this may be minimised with the release of Service Pack 3 for Win XP Pro, but could offer no release date for this. From my limited understanding, many of these updates make changes primarily within the system registry and, as such, performing a standard "pick your folder to back up" routine will not work. Surely someone out there has figured out a way to create backups of these weighty files?

Phillip Walters
Dubbo, NSW

READER'S PRAYERS ANSWERED!

I had a little smile to myself when I read Justin Edmunds' letter in the

July edition of your fine magazine (page 33). A little over five years ago, I purchased a Microsoft keyboard from Harris Technologies, the MS Office Pro. As far as I was concerned, it was very advanced for its time. It had a scroll wheel, toggle for moving between applications, buttons to go forward and back on the web, programmable function keys (as well as keys to launch all the Office applications). Despite all of this, the most useful three keys on the whole keyboard were for *Cut, Copy and Paste*. They were really great — but for quick work, Ctrl+C and Ctrl+V are still the best. Where the Cut, Copy and Paste keys come into their own is when you need to copy and paste multiple (ie. 10+) separate items. I have been looking for a wireless keyboard with the same functionality but have been unsuccessful. I think I'll just have to stick with the wires.

Robert Lindbeck
Rouse Hill, NSW

MEDIA WATCH

Judging by the photo you used, I suspect your writer might have contributed more than just "copy" for the Dumbest Moments in Tech column in APC August (page 11, see above right). Having been to

letter of the month

THE HOST WITH THE MOST

I enjoyed your recent article on "Hosting choices" in the August edition of APC (page 104). I have been using Ilisys' web hosting for about four years. Before that, I went through a US-based hosting company. This ended up being a complete nightmare in which I lost money after calling internationally to get any assistance (I had to call as they wouldn't answer my emails!). A friend of mine has his hosting in India; he can't get his CMS-based site working properly

and suffers poor communication with the support staff. It's nice and cheap per month, however!

So, my recommendations (apart from price) for the criteria to evaluate — if you are looking for a hosting solution — is to call their support and see, one, if they are human and, two, if they can speak in non-technical jargon and in a friendly and courteous manner. Three, check whether they answer or return calls in a reasonable time and four, see if they offer a one-stop-shop (to register domain names,

set up email etc.) and offer services with open source solutions (ie. Ilisys offers free phpBB forums and CMS). I am only a small company, but I feel like I am treated like anyone else. Cheers to Ilisys for setting such a high standard.

Mark Kelly
Cyber Services
Preston, Vic

Mark wins this issue's Letter of the Month prize, a Logitech MX3000 cordless laser mouse and keyboard set valued at \$179.95.



music
Fi

An authority on the matter: one keen reader calls BS on this BS (but our designers confirm that "the donor of the substance in question did in fact eat a steak beforehand...").

Agricultural College in my youth and living in a rural area, I can tell you for the record that your illustration does not look like "bullshit" (or a cow pat for that matter). I think a change of diet might be in order.

Alan McWaters
Stanthorpe, Qld

SAVINGS AHoy!

We've been looking around for mobile battery chargers for our Dell laptops and I couldn't believe the difficulty in finding whether a specific charger would actually work with our specific model of laptops (let alone the cost). I inadvertently found a great solution in our local Whitworth's sailing shop — a 12-volt inverter sold primarily for use on boats. The model is rated at 150 watts and has been tested without problems on our laptops. The bonus was the cost — \$79 against \$120. The DC/AC adapter can be found on the Whitworth's web site at www.whitworths.com.au. Happy cheap charging!

Steve Bryant
Newport, NSW

IMPERIALISST PIGGS

As a veteran Microsoft Word user, I have long been suspicious of the so-called "Australian English" spellchecker; my experience has been that it is more American than Australian. I usually go over to UK English and find it is the closest approximation to Australian spelling. I was reminded of this today when editing a report and "a herbal" was corrected to "an herbal", reflecting the quite bizarre pronunciation of "herbal" which many Americans adopt. I doubt

whether much work has been put into Microsoft's "Australian English" and I suspect it is really just American English with a few of our more common usages thrown in for cosmetic purposes. If another reader can tell me how it is possible to eliminate American English completely from Microsoft Word (so it never, ever rears its ugly head), I would be very grateful.

Leon Le Lu
Googong, NSW

HEAVEN 2.0

Thanks for the "High-def heaven" Labs Challenge in APC July 2006 (page 62). In the definitions box you state: "Interlaced only displays every second horizontal line, rapidly switching between the odd and even numbered lines," and "Progressive displays every line at once, creating a sharper picture." Progressive actually paints each horizontal line in the display in turn, starting at the top and finishing at the bottom, each and every time the display is refreshed. The refresh rate is what you refer to as the number of frames per

second. So, for a moving object in the display, its new position is shown every time the display is refreshed. Interlaced paints every second line in the display for each time the display is refreshed, swapping between the odd and even lines in alternate refreshes. So, interlaced requires two display refreshes for all the lines in the display to be refreshed. On an interlaced display, only half a moving object is depicted in its new position every time the display is refreshed.

Consequently, the progressive display is sharper and clearer.

Peter Haughton
Lilli Pilli, NSW

LOOK MA, SPREADSHEETS

The best-selling computer of all time was the Commodore 64, with over 30 million units sold between 1982 and 1993. It was such a big seller because it could really be used by anybody, from kids to the serious geek; it could be switched on and anything from games to spreadsheets could be loaded — with no fear that anything could stuff up beyond the reaches of a reset. Modern console manufacturers should get back to this idea, as most systems have all the hardware in place — so with the addition of a simple keyboard and a basic OS, people could be emailing and writing simple programs in no time. This would give consoles a whole new audience (with mums and dads having the legitimate excuse of buying one for educational purposes and the secondary function being games). Hey — it worked for the Commodore 64.

Phillip Fay
Arundel, Qld

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Come on, have your say! We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to epinions@acpmagazines.com.au. All correspondence becomes the property of APC and is subject to editing. Letters must include writer's full name, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the Month prizes. Phone details will not be published.

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From inside the Lab... A new socket please!

We've ranted and railed in APC in the past about ever-changing CPU sockets and the hassle and expense involved in upgrading a motherboard when all you want a new chip. But this time, we really want a socket change.

With the Core 2 Duo well and truly released, we're hearing heaps of confusion over just what will and won't support the new CPU. Where it's all stemming from is that the Core 2 Duo uses the existing Socket 775 (Socket T) that's been in use with the Pentium 4 and Pentium D lines for some time now. It's all well and good, but a lot of older boards that use Socket 775 won't work with Core 2 Duo.

To add further fuel to this fire, it's not just a case of flashing a BIOS to get Core 2 Duo working on these apparently compatible boards. Many board manufacturers need to re-jig the power routes on the motherboard

to provide the lower voltages the Core 2 Duo needs. Case in point: the ASUS P5N32-SLI SE Deluxe reviewed page 38 is the spitting image of the P5N32-SLI Deluxe that has been the mainstay of gamers and overclockers for an IT eternity. But it's not the same board. Popping a Core 2 Duo into the old board will get you precisely nothing. So, people who've invested in the P5N32-SLI (the original) can't upgrade to the new chip without buying exactly the same board with only a slight modification.

We're not pointing fingers here, as ASUS didn't do this on purpose, but it is galling to pay twice for what is essentially the

same product (and you will, if you want the fastest Core 2 Duo system you can buy).

Considering the Core 2 Duo is a major change in Intel's desktop (and server and mobile) direction, including the unthinkable (dropping the venerable Pentium brand), everything about the Core 2 Duo is different except the socket. If the socket were different, then we could grudgingly forgive the lack of a direct upgrade path and relegate our current PCs to the last generation. But when you've got a current system and a new CPU that pops right in but doesn't work, then all you're left with is a bad taste in your mouth. [apc](#)



WE'RE NOT POINTING FINGERS HERE,
BUT IT'S GALLING TO PAY TWICE FOR WHAT
IS ESSENTIALLY THE SAME PRODUCT

NICK RACE - TECHNICAL EDITOR

SUSE Linux Enterprise Desktop 10

Novell's latest enterprise offering, complete with a whizz-bang 3D desktop.

Ever since Novell first acquired SUSE in 2003 we've been watching how the company has developed Europe's most popular Linux distribution. At the time there were fears Novell would drop the ball, but these proved unfounded. In fact, Novell's commitment to open source has spawned a number of projects, including Xgl — the first truly 3D (OpenGL accelerated) desktop for Linux (Sun's Java-based Looking Glass project aside). Indeed SUSE Enterprise Desktop 10 is the first commercial distro to include Xgl out of the box.

On a single DVD, SLED 10 includes packages for Gnome and KDE-based desktops, though Gnome is the default. Installation is seamless, providing a fast-track system as well as advanced configuration modes. In this regard the installation routine is excellent — full support and configurability for any mix of LVM (Logical Volume Manager) and software RAID, along with all popular file systems except JFS. Reiserfs is the file system of choice by default. As you'd expect, partitions can be created, deleted, and resized including those using NTFS. Also, a preferred disk configuration can be imported from an /etc/fstab file.

Packages can be selected individually or by "patterns" — pre-defined usage scenarios that include definitions like "Gnome Desktop" and "Laptop". Generally, everything you need for a desktop system is pre-selected, including Firefox as the system's browser, the entire Open Office suite, and even proprietary modules such as Acrobat and Flash.

A single reboot occurs after packages are installed, after which a final configuration is required — user creation, network configuration, boot



Beagle is the Linux answer to Apple's Spotlight.



Clean and minimalist is theme of the day.

No "Start" menu here, but grouping by favourites.

loader installation and so on. GRUB (Grand Unified Bootloader) is used here and, while SLED is designed to be a contender over Windows for the enterprise desktop, it will detect and manage dual-boot Windows/Linux configurations. Optionally, you can also import a GRUB configuration file already present on the system and merge into SLED's config. Very nice.

Finally, after installation, the entire configuration can be saved and used as a basis for desktop rollouts.

There's no denying Novell has given its business desktop a polished look and feel — the "Computer" button

forges the traditional application tree and displays a list of favourite applications and a search box to find more. This list includes most of the essentials — Firefox, OpenOffice Writer, Evolution for mail, and a link to the Home folder. On the less essential side is a photo viewer and integrated music player. A full list of installed applications can be bought up with the More applications... button, and this includes IM software, a full range of multimedia apps and all the usual system configuration tools.

For searching it comes bundled with Beagle, the Linux equivalent of Apple's Spotlight. Also included is Novell's AppArmor for security.

Not everything in SLED is a breeze, however. Package management and updating is a mixed blessing: the Auto-updater and Software installer

look and operate nothing like YaST's package management tool, which is confusingly called upon in place of the Novell tools, depending on what you are doing (like sourcing official Nvidia drivers). Furthermore YaST's is not only easier to use, but more comprehensive — packages show up to update or be installed under YaST that don't exist under Novell's Software Installer!

And then there's Xgl — yes it's eminently sexy, stylish and impressive. You can rotate the desktop on a cube, watch wobbly windows fade into view, and zoom in and out of the desktop at speed — but it's mostly eye candy and, while optional, the fact it's included at all for a desktop targeted at enterprises is quizzical. It has strict requirements (supported Nvidia and ATI drivers a must) and is prone to intermittent freezing, at least on our system. It's almost as if Novell is trying to steal some of Vista's thunder before it arrives.

All up, SLED 10 is a comprehensive, well-designed, Linux distro with all the essential applications and connectivity for the business environment. Plus, it bundles Xgl (if you want to show off to your friends).

Ashton Mills

CONTACT Novell
PHONE (02) 8281 3400
ONLINE www.novell.com
MARKET Enterprise
PRICE \$87 (with one year of support)

Fine-grained control over install and system configuration.

VERDICT ★★★★★

Package management unintuitive; Xgl more form than functionality.



THERE'S NO DENYING NOVELL HAS GIVEN ITS BUSINESS DESKTOP DISTRIBUTION A POLISHED LOOK AND FEEL

FIRST TEST

Apple Mac Pro

Nick Race powers up the new Apple Mac Pro.

Mac enthusiasts have been hanging off every whisper that comes out of Cupertino, since the announcement and release of the MacBook and MacBook Pro, for the slightest hint of what was in store for the now-aged G5 series Mac tower. On August 8, Steve Jobs announced the G5's replacement: the Apple Mac Pro. As predicted, the new Mac has gone Intel, finalising the replacement of the PowerPC line with Intel's x86 architecture.

Amid the fanfare and flourish of any Apple-centric conference, other products were announced: a new Xserve (Apple's largely ignored server range) and the newest version of Mac OS X, codenamed Leopard.

So what, exactly, is in the box? The new Mac Pro is a dual-Xeon system, using Intel's new "Woodcrest" Xeon processor. The system uses fully buffered DDR2 DIMMs (FB-DIMMs), SATA hard disk drives, and offers support for PCI Express graphics cards and add-ons.

We received the default configuration for the Mac Pro, which includes two Intel Xeon X5150 processors at 2.66GHz, 1GB of fully buffered 667MHz DDR2 RAM, a 250GB SATA Western Digital hard disk drive and a 16x Super Multi DVD writer, supporting DVD±RW and dual-layer recording. Populating the double-width PCI Express slot is an Nvidia GeForce 7300 GT with 256MB RAM.

The base system is dramatically less than the full potential. The system is capable of supporting up to 16GB of DDR2 over eight slots, two optical drives and four hard disk drives. The Mac Pro includes support for up to four PCI Express 16x video cards, but only one slot has room for a double-width cooler (most often seen in higher-end graphics cards).

• **CONTACT** Apple
• **PHONE** 13 36 22
• **ONLINE** www.apple.com.au
• **MARKET** Everyone
• **PRICE** From \$3,999

The memory is seated on two slide-out daughterboards, surrounded by oversized clip-on heat sinks. The purpose of the heat sinks isn't terribly clear, as DDR2-667, even in fully buffered form, is unlikely to need assistance in cooling.

Apple's claims for what the system can support is strangely less than what the system can theoretically handle — except of course for the size limitation of the case and the motherboard.

The chipset and Xeon processors can support up to 16 DIMM slots for 64GB of memory and Apple has imposed a limitation of 2TB of hard space; though populating the system with 750GB Western Digital or Seagate hard disk drives would push this up to 3TB without drama.

✓ Strong workstation performance.

VERDICT ★★★★★

✗ Default configuration not ideal.

THE CHIP

Intel's Xeon "Woodcrest" is part of the Core architecture family (like Core 2 Duo "Conroe" and "Merom"). The three processors use a common architecture that has replaced Netburst from the Pentium 4 line. Woodcrest Xeons come in two ranges: the X7000 series for servers using four processors or more, and the X5100 series, which is in the Mac Pro.

The Core architecture was a seachange for Intel. It uses a shorter pipeline and improved memory access technologies for increased performance. The Core 2 Duo has created a huge impact on the desktop market and Apple's choice to skip over the cheaper Core 2 Duo parts for the Xeon family is most probably due to its penchant for multiple CPU systems, which Core 2 Duo does not support.

The X5100 comes in three speeds: the X5130 at 2.0GHz, X5150 at 2.66GHz and the X5160 at 3.0GHz. All of the processors are dual-core, have 4MB of cache on chip and feature dual



independent buses between the CPU and main memory at up to 1,333MHz.

The Mac Pro uses the Intel 5000X chipset for the new Xeons, which supports the new memory type, processors and PCI-E that the old E7525 didn't. The 5000X can run 24 PCI-E lanes and optimised network IO (Intel I/O Acceleration Technology), which isn't implemented in Mac OS X.

One of the major changes in the Xeon line with the Woodcrest, and one which makes the Xeon a top performer in workstations like the Mac Pro, is the inclusion of support for fully buffered DIMMs, which offer a serial path between banks and the Northbridge (which increases the throughput dramatically).

A major improvement, especially considering the market share of Apple in the multimedia content creation industry, is the optimisation of SSE3 functionality for the Core architecture. The new vector engine in the Woodcrest (and Core 2 Duo) allows SSE3 instructions to be run through with a single 128-bit execution pass — dramatically increasing the speed with which video, graphics and audio is processed by the CPU.



WE SPECCED UP THE MAC PRO AS WE FELT IT "SHOULD BE" CONSIDERING THE SIZE OF THE INVESTMENT (AND IT WASN'T CHEAP)

Other additions to the Xeon include memory RAID functionality for increased memory throughput, an Error Correcting Code (ECC) function on the system bus itself and Intel virtualisation technology.

CHOOSE YOUR WEAPON

Apple's web site ordering offers a massive combination of builds for the Mac Pro, but some of the hardware choices are puzzling. For a start, the default configuration as supplied to APC had us scratching our heads. Why pair a quad-core, top-of-the-line workstation system with such a budget Nvidia GeForce 7300GT graphics card? Surely, if you need a dual-processor system squarely aimed at multimedia content creation, a high-speed 2D or professional 3D card would add much more value than an extra processor?

We specced up the Mac Pro as we felt it "should be" considering the size

of the investment (and it wasn't cheap). With an upgrade to two 3.0GHz processors, 4GB of RAM, no additional hard disk drives and a workstation-class Nvidia Quadro FX4500 512MB it put us at \$7,137, which is a big kick in the wallet. Surprisingly, when we matched it as closely as possible with a system from Dell with the Precision 690, the Dell's price blew out to over \$10,000 (showing the Mac Pro to at least be fair value for money).

ON THE BENCH

We tested the Pro using Mac-oriented but multi-platform benchmark Geekbench, which offers a synthetic score based on memory, CPU integer and floating tests using common algorithms. Geekbench is cross-platform, which also gives us a good indication of where the Mac Pro sits as compared to a range of PCs (both stock and overclocked). The system managed a score of 294.7, compared

to the top score submitted to the web site of 483.5 — though that is an overclocked Core 2 Duo machine. Also, in comparison, Geekbench report a Mac G5 dual-CPU system (the last top-of-the-line) at 278.3; so the new model, when averaged over the test, is around 5% faster.

Even with a new core, the Apple never falls far from the tree. This wonderfully powerful yet strangely underspecced machine is a positive move and shows Apple's adoption of Intel technology will provide definite benefits for Apple customers. Be aware, buying a stock machine without customising it with more RAM and possibly a better video card will hobble the machine unnecessarily. Also keep in mind that the thin spreading of the 5000X's PCI Express lanes means the 2nd to 4th PCI Express slots won't allow extra video cards at full speed.

Nick Race



Transition completed: the Mac Pro is the last of the Apple line to make the transition to Intel tech.

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Sony VGN-AR18GP

Grab some popcorn and take a look at Sony's first Blu-ray notebook.

As far as Sony is concerned, mobile high definition has arrived with its AR18GP model, the first in the VAIO family to feature a Blu-ray drive. This entertainment-focused notebook boasts a

17in wide-screen 1,920 x 1,200 resolution display, top-of-the-line Intel T2600 dual-core mobile processor, two 80GB drives in a RAID configuration and Nvidia's GeForce Go 7600 GT graphics.

Sony has gone to great lengths to include all the goodies users would expect from a high-end notebook, with the looks of a machine you're not going to be embarrassed to leave on your coffee table when friends come over.

Multimedia is well and truly taken care of with a quick-launch mode, easy-adjust audio controls and an eject button right next to the keyboard (to stop you needing to play the blind-poke drive-eject game).

The display is large, bright and very

CONTACT Sony
PHONE 1300 137 669
ONLINE www.sony.com.au
MARKET Prosumer
PRICE \$5,499

✓ Blu-ray playback and recording.

.. VERDICT ★★★★★

✗ Expensive; cost of media.



crisp, and the coating on the screen only helps amplify its great colour and contrast levels. Unfortunately, the AR18GP only ships with Windows XP Pro instead of Media Center and we're puzzled as to why there's no option for even a standard-def TV tuner, let alone HD.

Serious AV buffs will be pleased to note it includes S-Video and HDMI output, letting you hook up your spanking, new Blu-ray player to your existing home theatre setup. If only there were more titles to watch. Sony bundles Blu-ray authoring software, making this great for high-def capture, editing and burning.

We burnt a sample BD-RE (Blu-ray rewritable) disc with 23GB of

data. At three hours per disc it's not exactly speedy, but does give you the option to archive bulk amounts of photos and video (if you don't mind splashing out on the media).

Real-world testing returned impressive scores for both regular desktop usage and gaming and, for its size, just shy of two and a half hours of battery run-time isn't too shabby. An all-rounder that's easy on the eye and has the go to perform everything you can throw at it, the AR18GP carries a premium price tag, justifiable for early adopters — just don't expect to watch the extended *Lord of the Rings* trilogy movies while on the move.

Dan Chiappini

HP Compaq nw9440

Need some grunt in the field? This Mobile Workstation offers plenty.

HP's new Mobile Workstation is designed from the ground up for CAD, graphic design and intensive computing requirements. It's one mean system you can use on the go.

The machine submitted to APC was built around an Intel Core Duo processor T2600 running at 2.16GHz. The notebook is based on an Intel 945 motherboard with 1GB of RAM and a 100GB Hitachi hard disk drive. 802.11a/b/g and Gigabit Ethernet provide network support and an 8x DVD±RW is included. PCMCIA slots are included, but strangely there's no ExpressCard slot — which is starting to see use with mobile broadband providers.

There is a built-in 56k modem, four USB ports, FireWire, S-Video out and a 7-in-1 card reader.

What sets this undoubtedly powerful notebook apart from a standard home user or business model is the inclusion of an Nvidia Quadro FX 1500M discrete graphics adaptor with 256MB of RAM. The Quadro is well-suited to CAD and multimedia content creation, but is definitely overkill for business and day-to-day use. The nw9440 also includes business-oriented features including a TPM security chip and biometric fingerprint reader. Software bundled includes disk sanitisers and drive-locking utilities for increased security.

The system has a bright and clear 1,600 x 1,200 resolution 17in panel, suitable for working in bright environments. A built-in light-level sensor automatically adjusts the brightness on the panel to make it easier to see (and saves battery life). All this weighs just under 4kg.

On the bench, it performed admirably, clocking 5,306 in PCMark05 and a 3DMark05 of 7,222. Winstone scores showed the nw9440 is truly capable with a Business Winstone score of 21.9 and Multimedia Content Creation at 30.9. With all this power under the hood, the Mobile Workstation still posted

a great battery life of three hours, 11 minutes (with a dim screen and Wi-Fi turned off). You'll get less in the field but, considering the grunt, it's a fine result. However — all this doesn't come cheap.

Nick Race

CONTACT HP
PHONE 1300 305 017
ONLINE www.hp.com.au
MARKET SMB
PRICE \$5,499

✓ Outstanding performance for a notebook.

.. VERDICT ★★★★★

✗ Could be more rugged; expensive.





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ASUS P5N32-SLI SE Deluxe

An old chipset — with a new chip.

Nvidia released the 500 series of nForce chipsets to coincide with the launch of Intel's Conroe and AMD's AM2 processors. ASUS also updated its premium SLI motherboard to run Core 2 Duo processors, which it does with aplomb. According to ASUS' Australia Component product manager Albert Liang, the major difference between the revisions of this board is a PCB refresh and new voltage modulators to support the new levels of the Core 2 Duo Processor. And, of course, a new BIOS.

The P5N32-SLI SE Deluxe has a full complement of features. Thanks to the chipset, it has two PCI Express x16 slots running at full speed, two PCI Express x1 slots and a single x4 slot.

Two PCI 2.2 slots are included. As well as the four SATA ports and RAID offered by the nForce, the board is provided with a Silicon Image 3132 chip for internal and a single external SATA connection. It has dual Gigabit LAN, multiple USB 2.0 ports and a long list of bundled accessories.

The board supports 1,066, 800 and 533MHz FSB processors from Pentium D, Pentium 4, Core 2 and Celeron ranges in Socket 775. Memory is supported up to 800MHz (non ECC). We built a system using an Intel Core 2 Duo 6800 running at 2.93GHz with 2GB of Corsair CM2x1024-6400C3 DDR2 running at 800MHz, an HIS



X1900 GT video card and a 10,000rpm WD Raptor — to see how far we could push the nForce 4 chipset. It benched an impressive PCMark05 of 7,523, with a 3DMark05 of 10,139. Our test WMV HD encode took 10 minutes, 37 seconds — close to a Labs record at stock speeds. It's got a good pedigree — an Nvidia nForce 4 chipset with stable, fast drivers (compared to the

relatively new software support of the nForce 500 series and 965/975 boards from Intel). Though it may gall paying for last-generation tech, if you want the fastest, most stable platform for your new Core 2 Duo, this is it.

Nick Race

.. CONTACT ASUS
.. PHONE 1300 278 788
.. ONLINE www.asus.com.au
.. MARKET Performance enthusiast
.. PRICE \$379

✓ The fastest Core 2 Duo platform available; stable and mature.

.. VERDICT ★★★★★

✗ Nothing new here!

HIS Radeon X1900 GT Dual DL-DVI

A high-powered video card at a reasonable price.

Unlike most of the Taiwanese OEM manufacturers, Hong Kong-based Hightech Information Systems (HIS) is one of the few companies that deal solely in video cards. This may sound rather limiting, especially considering they only stock cards based on ATI's chips, but it does give them the advantage of being able to

specialise and improve on reference designs as provided by the original manufacturers. HIS produce a range of overclocked, video-specialised and extensively bundled cards primarily for the gamer market.

This month we received the new entry-level high-end card; an HIS-branded ATI Radeon X1900 GT. Compared to the XT and XTX X1900 Radeons, the GT model is limited to 256MB RAM — unlike the other cards in the X1900 series which sport 512MB as standard. It's clocked at 575MHz core and 600MHz for the

.. CONTACT Altech Computers
.. PHONE (02) 8831 9999
.. ONLINE www.hisdigital.com
.. MARKET Performance enthusiast
.. PRICE \$495

✓ Good performance without breaking the bank.

.. VERDICT ★★★★★

✗ The Platinum Pack is a little uninspired.

memory (effectively 1,200MHz with DDR2). GTs sport 36 pixel shaders to the XT and XTX's 48 and it has the same eight vertex shaders as the more expensive models.

The HIS X1900 GT uses ATI's 90nm process for a cooler-running card, keeping the cooler down to a single slot, unlike the double-width required for Nvidia 7000 series and ATI X1900 cards. This makes it a bit more practical in smaller cases, as well as a tad quieter on the fan front.

On the testbench, the HIS X1900 GT did well. Benched with an Athlon FX-57 and 1GB of DDR400 on an Albatron KM51VP motherboard, the system clocked 4,360 in PCMark05. Gaming tests showed the card quite capable: Quake 4 averaged 57.4fps

running at 1,280 x 1,024 in High Quality mode with 4x anti-aliasing turned on. 3DMark05 with default settings awarded the HIS X1900 GT a score of 9,473 — and running at 1,280 x 1,024 with 4x AA, it still managed to clock a very respectable 7,118.

The deal is sweetened with this particular card by a swag of cables, Dungeon Siege (the game), Cyberlink PowerDVD and a bunch of game demos. Though this "Platinum Pack" doesn't seem to offer anything over any other video card's package, it's better than nothing. All in all, the HIS Radeon X1900 GT — and the GT in general — is a great balance between performance and price.

Nick Race



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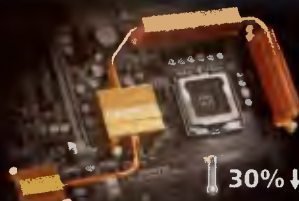
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Electrolytic Capacitor

This chart is for reference only

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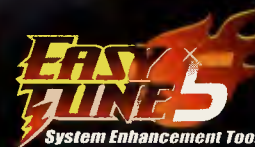


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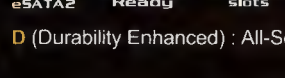
Supports Intel® Core™2 Duo processor



Quad BIOS



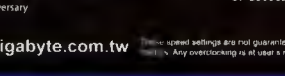
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Quad Triple Phase



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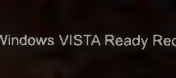
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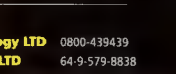
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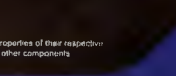
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TECHNOLOGY

Silverstone SG01-Evolution

Like the Tardis, the SG01 is bigger on the inside.

Silverstone has a good reputation around the hallowed APC halls for great-quality power supplies and enclosures, so without any hesitation we jumped at the opportunity to check out its new small form factor case.

The SG01-Evolution is a small case designed for a microATX motherboards and a full complement of accessories. It's about half-again as large as a Shuttle-style barebones kit, measuring in at 216mm x 263mm x 393mm (HWD). It has a black, brushed aluminium finish that stands up well to smaller bumps, knocks and scrapes. It is also available in silver.

The SG01-Evolution was designed to be a small form factor case that can

still accept high-end graphics solutions — and that means plenty of space and plenty of cooling for two double-width video cards.

It performs admirably in this task, with two Nvidia GeForce 7950GX2 double-width monsters fitting in with a little room to spare. An angled fan allows for clear internal/external air exchange and oversized vents let more air flow through the case in general.

The SG01-Evolution can accommodate a full-size (and some slightly oversize) ATX power supplies, ensuring you'll be able to power multiple video cards effectively. Two 5.25in bays can hold optical or floppy disk drives with plenty of depth for

longer drives. Internally, it can hold two 3.5in disk drives, or even three if you're willing to sacrifice a 5.25in external slot.

The front of the case has a comprehensive IO panel including four USB 2.0-compatible slots, one FireWire and one headphone jack connected from motherboard headers. Light-touch, metal power and reset buttons finish off the stylish look of this case.

We built up a system in the Silverstone, finding that it nicely accommodates the larger video cards on the market. While there's absolutely no spare room after an SLI solution is fitted, the multiple included

fans kept it all cool enough to operate fine at stock speeds. A Prescott Pentium D was also included in the system and the case's airflow coped with it just fine.

If you're in the market for a small case but still want a top-of-the-line system, the Silverstone SG01-Evolution won't disappoint.

Nick Race



.. CONTACT Altech
.. PHONE (02) 8831 9999
.. ONLINE www.silverstonetek.com
.. MARKET Performance enthusiast
.. PRICE \$220

✓ Can fit large, double-width SLI solution.
.. VERDICT ★★★★★
✗ Too large for a lounge room PC.

Albatron KM51PV motherboard

If you're looking to build a low-cost PC, here is the place to start.

Most often we focus on the latest and greatest here in the APC Labs, but sometimes it's worthwhile to look back at products that may have slipped under the radar. Some kit improves with age — as drivers mature, hardware reaches second or third generation and the price drops.

The Albatron KM51PV is one of those products; it's been on sale for some time, but has never appeared in APC. What made us take a look were numerous emails about building lower-cost PCs for the kids, experimenting with Linux or playing movies in the lounge room.

The KM51PV is an Nvidia nForce 4-based motherboard supporting AMD Athlon and Sempron Socket

939 processors. With expected price drops on AMD chips, they're going to be the new budget PC must-have. The board supports 4GB of RAM in four slots up to DDR400, one PCI Express 16x card and two PCI cards. There's provision for four SATA hard disk drives and two IDE channels. It uses the Nvidia C51PV Northbridge that includes on-board GeForce 6150 graphics; though not suitable for HD playback, it's more than adequate for current-generation MPEG-2 and MPEG-4 (DivX) video. The integrated graphics have both DVI and D-Sub connectors built in to the board.

The board is microATX-sized for smaller cases and is

reasonably well laid out. Our only criticism is that if a double-width video card is installed, it blocks the single 1x PCI Express slot — though in fairness there's very little on the market that uses the slot anyway. The board is passively cooled with the CPU fan cooling the Northbridge.

We built a test bench from an AMD Athlon FX-57 with 1GB of DR400

and the HIS Radeon X1900 GT (see review page 38). The system performed admirably, posting a PCMark of 4,360. If you're looking at putting together a small and quiet budget system, the Albatron KM51PV is a good platform on which to build.

Nick Race



.. CONTACT Albatron Australia
.. PHONE 1300 855 245
.. ONLINE www.albatron.com.au
.. MARKET Everyone
.. PRICE \$129

✓ Small, stable; DVI output.
.. VERDICT ★★★★★
✗ No S-Video or composite; basic audio functionality.

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Iomega StorCenter Wireless 1TB

Well-rounded functionality for all your media and network storage needs.

Networked storage has become an attractive option for homes and small businesses with multiple computers; having a terabyte of storage no longer boosts your geek quotient like it used to.

Iomega's latest product in

this space offers a well-chosen set of features that are useful for domestic and office situations.

As the name implies, it comes with Gigabit Ethernet and 802.11g (client or access point). We expect WPA support on all Wi-Fi devices and Iomega didn't disappoint us.

The nominal terabyte provides 930GB in the default RAID 0 (striped) configuration. The drives can be reformatted as JBOD (just a bunch of disks — data progressively fills the drives in turn), RAID 5 (striped with parity for improved fault tolerance) or RAID 0+1 (a mirrored pair of striped volumes, which reduces the capacity to

465GB). The device is managed through a web interface.

Apart from the basic file server functionality, the StorCenter includes a UPnP AV media server so movies, audio and pictures are accessible via compatible media players. Any one folder and its subfolders can be shared in this way. We tested it with two different PC-based clients and it worked flawlessly.

Two USB 2.0 ports allow the connection of external drives and/or printers. Digital cameras are also catered for: photos are automatically transferred to a selected folder (eg. that used by the media server for photos) when a camera that supports PTP is plugged into a USB port.

The software bundle comprises Iomega's Automatic Backup Pro (for scheduled backup of entire PCs or selected folders), Discovery Tool (to simplify mapping a drive letter to the StorCenter) MusicMatch Jukebox and Adobe Photoshop Album 2.0 Starter Edition.

Despite the external power supply, the StorCenter was slightly noisy; which is alright for a typical office, but not something you'd want in your lounge room.

The styling drew mixed reactions from the crew in the APC Labs — the glossy silver case fits in with the current crop of home entertainment devices, but the approximately square profile doesn't.

Documentation is a weak point — the quick start guide gets you up and running, but the on-disc manual lacks detail and at least one linked page is missing altogether.

Stephen Withers



CONTACT Iomega
PHONE 1800 466 342
ONLINE www.iomega.com
MARKET Everyone
PRICE \$1,999

✓ Flexible storage.

VERDICT ★★★★★

✗ Slightly noisy; deserves better documentation.

Tilda .09.3

Taking a leaf from the first-person-shooter comes a drop-down terminal for Linux.

Tilda is one of those programs that makes you wonder why it wasn't thought of earlier. If you're tired of dragging windows around or managing multiple desktops just to find your console to enter a command, then Tilda is for you.

Based on the simple drop-down console first seen in Quake all those years ago, Tilda allows you to assign a key to bring down and roll up a fully functional console on demand. It overlays windows, so you can call it down, issue some commands and then clear your view again with a single key.

Tilda is desktop-agnostic and will work just the same under KDE or Gnome, though it does need GTK for

its configuration interface. If you prefer not to muddy desktop environments, an equivalent console is available for KDE called YaKuaKe (or "Yet Another Kuake" console), which is based on the same principle.

Unlike its stock KDE and Gnome counterparts, Konsole and Gnome Terminal respectively (which represent some of the more fully featured — or bloated — consoles available), Tilda is lightweight and exceedingly fast. Putting function before form, it doesn't currently feature snazzy abilities like randomised background JPGs, but it does support transparency if you want a less opaque look.

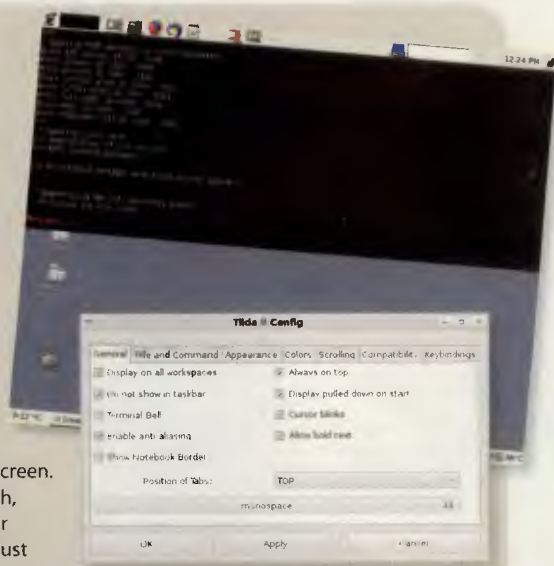
Tilda's configuration is quite flexible, allowing you to specify the width and height of the console when pulled down and where it should be positioned on screen. So it can, if you wish, expand across your whole desktop or just a part of it.

As a modern console, it features everything you'd expect to find including anti-aliased fonts and even tabs — which are all the rage these days.

As a design, the one-touch key to call or dismiss your console is much quicker than dragging windows or selecting your console from the taskbar. It's a cliché to say it (again),

but once you start using Tilda you'll wonder why you hadn't got onto it earlier. Well, one of the reasons for that might be that its SourceForge download is source only, but check with your distribution. There are .DEB and .RPM formats of Tilda publicly available and you can even find it in Gentoo's Portage.

Ashton Mills



CONTACT SourceForge
PHONE N/A
ONLINE <http://tilda.sourceforge.net>
MARKET Everyone
PRICE Free

✓ Slick, fast hotkey console.

VERDICT ★★★★★

✗ Still in development.

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TomTom GO 910

Not getting lost just got one step classier.

The new TomTom GO 910 shows just how good portable GPS navigation devices have become, and also where they can potentially lose their way. With a new, 4in 480 x 272 pixel touch-sensitive display, the 910 is TomTom's new top-of-the-range machine. It looks like a dwarfed wide-screen TV that attaches to your car's windscreen via a suction-cup mount, but is actually a 340g computer with 64MB of RAM, a hard disk and a Lithium-ion rechargeable battery.

Whereas previous models carried maps of Australia on SD cards, the 910 has a 20GB hard disk with full continental maps of

Europe, the USA and Canada — a boon for travellers. I tested it in the cramped streets of inner Sydney, where it easily found its way around, directing me with its clear, high-contrast, colour 3D maps (and spoken instructions in an Australian accent). Most importantly, it located my favourite chicken shop when I got hungry during the testing (it carries thousands of points of interest, such as petrol stations, cafes and restaurants).

The TomTom GO 910 does the fundamentals so well that it deserves nothing less than our Highly Recommended award. But it wants to do more. Much more. It's also an interface to Bluetooth



mobile phones. And a music jukebox — its built-in MP3 player is a poor man's iPod with its own selection of crappy songs. Clearly TomTom had no idea what else to put on the hard disk once the maps only took up 5GB.

My plea to TomTom is for the company to stick to GPS navigation and do it even better, rather than building media players. For example, creating a good mounting system for the TomTom GO 910 from the start, rather than having to

now ship a modified version. The unit we tested would easily lose its power connection hanging off its mount if it was not firmly placed on top of the dashboard as well. (Make sure you get the new mount if you purchase the TomTom GO 910.)

Tony Sarno

CONTACT	TomTom
PHONE	N/A
ONLINE	www.tomtom.com
MARKET	Everyone
PRICE	\$1,179

✓ Clear, high-contrast, colour 3D maps.

VERDICT ★★★★★

✗ Needs a better mounting system to ship with the unit.

Sony HDRHC3

Making HD easier and cheaper than its predecessor.

We reviewed the HC1 a while back and it received glowing praise (APC October 2005, page 43). Now the updated HC3 is on the scene. Is it better? Even if it wasn't, being a lot cheaper makes it amazing value already.

The two most obvious changes were real surprises, given the short time between the original and this update. First, the unit is now 26% smaller. It is very

easily managed in one hand and comfortable over extended use. The small but adequate viewfinder is now gone, replaced by a token effort instead — now it's all about the LCD viewer.

The other big change is the tape slot, shifted from the underside to a top-loading system. Huzzah! I applaud you, Sony, for being so quick to solve

something as fundamentally flawed as the previous design.

The new ClearVid CMOS sensor, a Sony creation, is said to improve on the original HC1. I can't spot a major shift on what was already a very nice image, but one new offering is the "smooth slow" recording mode, which effectively ups the field rate from 50i to 200i, giving access to a more authentic slow-motion option in editing.

Playing with the camera gives a quick sense that auto controls really are the *soup du jour*, with more of a focus on the touch LCD menu system than before. Spot metering and spot focus are personal favourites —

tap the screen and get an instant adjustment. There is also now an Easy button that puts everything into an auto mode for blissfully ignorant but very good quality video results.

With few manual controls, this is even less of an option for in-shooting tweekers. It's hard to say this is a shortcoming at such an impressively accessible price and with results that are hard to fault.

This is true 1080i HD that no-one needs to fear, with on-the-fly downsampling to SD still here if you need it. In short, a wonderful HDV camera for the amateur videographer.

Seamus Byrne

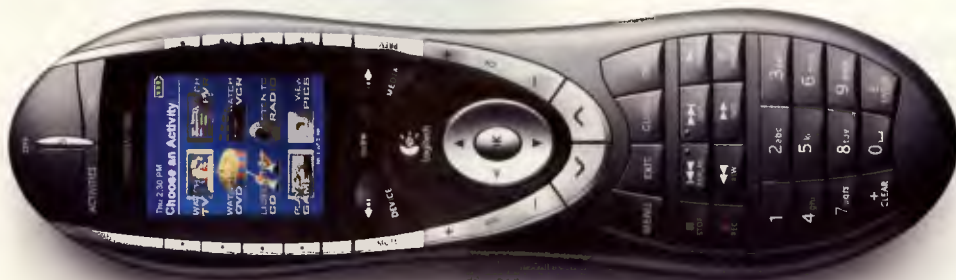


CONTACT	Sony Australia
PHONE	1300 720 071
ONLINE	www.sony.com.au
MARKET	Everyone
PRICE	\$2,299

✓ 1080i HDV: spot metering; smooth slow mode.

VERDICT ★★★★★

✗ Very limited manual controls; poor viewfinder.



ENTERTAMER

With the Logitech® Harmony® 880 Advanced Universal Remote, taming your home entertainment system has never been simpler. Just press a single button like "Watch a DVD," and Harmony 880 will automatically turn on your TV, DVD and stereo receiver, and adjust them to the proper settings. Colour graphics and text on the LCD screen make everything easy. Check out our family of advanced universal remotes at Logitech.com.



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New SharePoint Publishing Rule Wizard

Internal Publishing Details

Specify the internal name of the SharePoint site you are publishing.

Internal site name:

☐ ISA Server will use SSL to connect to this SharePoint site (recommended)

Based on your selection, the following Web site will be published:

Site:

New Exchange Publishing Rule Wizard

Publishing Type

Select if this rule will publish a single Web site or external load balancer, a Web server farm, or multiple Web sites.

☒ Publish a single web site or an external load balancer.

Use this option to publish a single Web site, or to publish an external load balancer in front of several servers.

☐ Publish a server farm of load-balanced Web servers.

Use this option to have ISA Server load balance requests between a server farm (mirror servers).

[Help about publishing Web farms.](#)

< Back Next > Cancel

HTTP Diffserv

General Priorities URLs Domains Networks

Supported priorities and Diffserv values:

Priority	Diffserv	Size Limit (byt...	Add...
High	010110	1500	
Medium	100001	---	
			Edit...
			Remove
			+
			-

☐ Allow special handling of request and response headers according to this priority (applies to the first packet only):

New Web Listener Definition Wizard

Single Sign On Settings

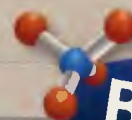
Single Sign On (SSO) allows users to authenticate one to ISA Server to access all published Web sites that use this Web listener.

☒ Enable SSO for Web sites published with this Web listener

The SSO domain name specifies the published sites between which this Web listener will allow SSO to be applied.

SSO domain name:

Example: To enable SSO between sites 'portal.contoso.com' and 'sales.contoso.com', the SSO domain is 'contoso.com'.



BETA TEST

A FIRST LOOK AT: Microsoft ISA Server 2006

Microsoft's ISA Server 2006 brings new advances in deep packet inspection, protection against DOS attacks and more. *Paul Schnackenburg* inspects Beta 1 of the new firewall.

Firewalls are critical to all business networks today. As the main (and often only) protection against the black hats on the net, firewalls have to evolve to meet new threats.

There was a time when most IT professionals believed security and Microsoft were two words that shouldn't be used in the same sentence. Microsoft's ISA server has proven its worth in the market for some years now and its ease of use is unparalleled. ISA Server 2006 is an evolution of ISA Server 2004 and also brings a few novelties to the party. ISA Server 2006 brings new advances in deep packet inspection, protection against DOS attacks and more.

As before, ISA Server 2006 comes in two versions: Standard and

Enterprise. Standard is a standalone firewall; Enterprise can be configured in arrays with several servers sharing the load or in chains for branch office via head office internet connections.

Enterprise edition uses the industry standard protocol Cache Array Routing Protocol (CARP) to spread the load amongst the participating array member's cache. Minimum system requirements are a somewhat paltry 550MHz PII, 256MB RAM, an NTFS partition with 150MB free for installation and Windows Server 2003. In reality, of course, you need a more modern machine unless your network is very small.

SECURE PUBLISHING

First off, there's Secure Application Publishing, designed to securely

publish SharePoint Portal Web Server sites to external users. This works with SSL. External users connect to the ISA server which decrypts and inspects the SSL traffic. Optionally, SSL encrypts it again and sends it to the internal web server. ❶ The response traffic goes through the same process, allowing the firewall to apply rules to the traffic even though it's encrypted.

This should make SharePoint sites even more attractive for small and big businesses alike, enabling access to selected internal information.

BALANCING THE FARM

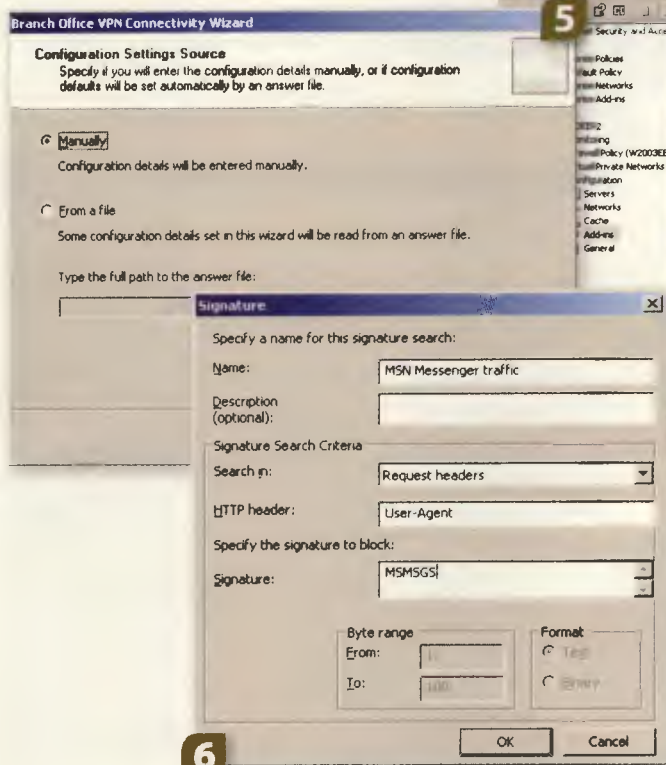
Also new in ISA Server 2006 is load-balancing for web server farms. This works with normal web servers, OWA (Outlook Web Access) servers and RPC/HTTPS access. ISA keeps tabs on the

servers in the farm with either a HTTP connection, ping or a TCP connection to a specific port. OWA farms are load-balanced using a cookie on each client. RPC/HTTPS access is balanced using source IP address. ❷ The states of the participating servers are Active, Draining (serving current connections but not accepting new ones), Out Of Service when down and Removed.

HTTP COMPRESSION

Another cool feature (it's actually in ISA Server 2004 SP2 as well) is HTTP compression. Using standard GZIP and Deflate (part of Windows 2000/2003), HTTP content can be compressed for bandwidth savings; all current browsers support this.

ISA Server 2004 Enterprise Edition relies on Active Directory to store its



- 1 The ability to easily invite outsiders to your intranet could very well be the best feature of ISA 2006.
- 2 Another really cool feature — let ISA load-balance your web sites.
- 3 Would you like your packets to jump the queue?
- 4 Another “little” feature sure to be a favourite amongst users.
- 5 Hooking up all those branch offices is now a much easier process.
- 6 HTTP deep scanning for the stressed administrator trying to rein in IM and P2P on his/her network.
- 7 ISA Server shines here with thorough packet inspection.

configuration; ISA Server 2006 uses an instance of ADAM (Active Directory Application Mode) instead. This removes ISA dependency on AD completely. ISA Server 2006 can also authenticate external users via LDAP, so the ISA Server doesn't need to be a domain member, increasing security.

3 Diffserv IP settings let you apply Quality of Service (QoS) tags to different web sites, giving traffic priority to certain sites over others.

WHO ARE YOU?

Different authentication methods get a lot of attention in ISA Server 2006. Valid authentication methods are client certificates, HTTP authentication and HTML Forms Based Authentication (FBA). Credentials can be checked against AD (Active Directory), AD via LDAP, RADIUS (OTP), plain RADIUS and RSA SecurID. New in ISA 2006 is the ability to customise FBA forms to corporate standards.

If you have two web sites published for external users, two logins would normally be required. New in ISA Server 2006 is Single Sign On. 4 A simple tick allows the credentials from one site to be used automatically on the other site.



THERE WAS A TIME WHEN SOME BELIEVED “SECURITY” AND “MICROSOFT” WERE TWO WORDS NOT TO BE USED IN THE SAME SENTENCE

LET'S BRANCH OUT

Deploying ISA for secure VPN tunnels to branch offices has been made a lot easier. The wizard makes configuration a breeze. 5 It also allows for saving the configuration to a file which can be sent to the branch office for simple setup at the other end.

Another new feature that can help both main offices and branch offices is BITS (Background Intelligent Transfer Service) caching. BITS is the protocol used by Automatic Update to dribble updates down from Windows/Microsoft Update to clients. ISA will store the updates in its cache and is aware of HTTP range requests so that if a branch office only has XP clients, only XP updates will be cached.

For centralised control, the Enterprise version for ISA is hard to beat. With a centralised enterprise policy, all array members adopt the same rules. A more flexible approach where a local administrator can add rules is also possible.

RUNNING INTO THE WALL

Firewalls work in several different ways. At the basic level there is packet filtering which looks at the headers of incoming packets; if port numbers match an allow rule the packet is let through — otherwise it's dropped.

The next step in firewall evolution is Stateful Packet Inspection (SPI), which looks at source and destination addresses as well as other header information in the context of other packets. Once again, only the header is checked for a match, with a rule to determine whether to allow or block the packet.

The issue with these approaches is that they can easily be worked around. Look at a program like MSN Messenger (or a peer-to-peer file sharing application). If their standard ports are blocked by a fastidious administrator, it's easy to tunnel traffic over port 80. Both SPI and packet filtering will allow this traffic through as they'll treat it as legal web traffic.

One strength of ISA is its deep packet inspection capabilities; it looks at the entire packet to make its allow/drop determinations. 6 This continues in ISA 2006 and allows blocking based on HTTP signatures, which makes it easy to stop IM and P2P applications efficiently. ISA can also look at which HTTP methods are used (blocking POST for example), file extensions, URLs and HTTP headers. 7 Several application filters provide support for DNS, FTP, POP3, RTSP and SMTP and others in this deep inspection.

Denial of Service attacks (DOS) and Distributed DOS attacks are common on the internet. 3 A new feature of ISA can help combat these: Flood Resiliency. This feature controls how many TCP, UDP and HTTP requests can be processed from one source address per minute. You may need to change the settings for your particular environment to prevent legitimate heavy traffic from being dropped, but overall these settings



Select Certificate

Select a certificate from the list of available certificates:

Issued To	Validity	Issued By	Expiration Date	Friendly Name
denver.contoso.com	Valid	Denver CA	1/15/2007	
Incorrectly Configured Cert	Invalid	Denver CA	1/15/2007	
mail.contoso.com	Valid	Denver CA	1/15/2007	
Sharepoint.contoso.com	Valid	Denver CA	1/15/2007	

- ③ Stem the flood, limit how much an IP address can send to your server.
- ② Digital certificates all over the place; ISA 2006 puts them all in their place.
- ⑩ Getting mail and calendars to remote users securely has never been easier.

8

Mitigation

Flood Mitigation | IP Exceptions

☒ Enable mitigation for flood attacks and worm propagation

Configure how ISA Server mitigates potential attacks:

TCP connect requests per minute, per IP address	Configure...
TCP concurrent connections per IP address	Configure...
TCP half-open connections	View...
HTTP requests per minute, per IP address	Configure...
Non-TCP new sessions per minute, per rule	Configure...
UDP concurrent sessions per IP address	Configure...
Set event trigger for denied packets	Configure...

☒ Log traffic blocked by flood mitigation settings

Help about Flood attack mitigation

OK Cancel

New Exchange Publishing Rule Wizard

Select Services

Select the services that you are publishing on this mail server.

Exchange version:

Exchange Server 2003

Web client mail services:

- ☒ Outlook Web Access
- ☐ Outlook RPC/HTTP(s)
- ☐ Outlook Mobile Access
- ☐ Exchange ActiveSync

< Back Next > Cancel



DENIAL OF SERVICE ATTACKS (DOS) ARE COMMON ON THE INTERNET – FLOOD RESILIENCY IN ISA 2006 HELPS COMBAT THIS

should help in DOS/DDOS situations. ISA Server 2006 also keeps tabs on the amount of kernel memory it uses and will deny new connections after a certain threshold is reached.

Managing digital certificates for published web sites, VPN IPSec connections etc., can be onerous on a busy ISA server. ② A new certificate management dialog shows all certificates and informs you of certificates that are about to expire or that are invalid.

PLAYING WITH THE OTHER KIDS IN THE MICROSOFT PLAYGROUND

ISA Server is positioned as the best firewall to have when you have other Microsoft products in your environment. This continues in ISA Server 2006 with the SharePoint support already mentioned and integrated Exchange Server publishing.

The wizard is extremely easy to use and provides support for all ways of

accessing Exchange from the net: OWA, OMA, Activesync and Outlook over RPC/HTTPS. ⑩ It's "version aware", unlike the wizard in ISA Server 2004; you can choose between Exchange 5.5, 2000, 2003 and v12 (2007). RPC over HTTPS can be configured to only allow encrypted connections.

Link translation isn't new in ISA Server 2006, but it has been improved with international support, cross array links and a faster engine. When you publish an internal web site to external users, absolute links on that site might point to other internal sites. When an external user clicks on the hyperlink it will fail because external DNS servers cannot resolve the internal server name. Link translation in ISA Server 2006 translates these links to other host names that are reachable from the internet, thus facilitating ease of use whilst requiring no recoding of internal sites.

Using IPSec is the preferred method of securing IP traffic.

The issue is often that if the traffic passes over a NAT firewall before reaching its destination, firewalls can't inspect the traffic. ISA Server 2006 supports IPSec NAT traversal (NAT-T).

As before, it's very easy to set up an ISA VPN Remote Access server for client connections. Both PPTP and L2TP with IPSec are supported.

ISA Enterprise edition integrates with the Network Load Balancing service in Windows Server 2003. This provides additional benefits over standard NLB and lets ISA control availability, including network and ISA services status.

HOW WOULD YOU LIKE YOUR ISA SERVED, SIR?

In medium to large businesses, a firewall is likely to be an appliance. It's a box specifically configured for this service with all extraneous functionality locked down. ISA Server 2004 Standard could be purchased in an appliance form factor; ISA Server

2006 offers both Standard and Enterprise in the appliance format. Advantages of an appliance are pre-configuration and hardening, ease of deployment and cost effectiveness.

Most appliances accept a USB flash memory key so you can easily apply configuration from an XML file. This, coupled with the new branch office wizard, should make shipping these to branch offices and setting them up a snap.

All in all, ISA Server 2006 is an evolution of ISA Server 2004; there are some new features, but mostly it's a spit and polish of existing functionality. Make no mistake though — ISA server is a serious contender in the enterprise firewall market with some unique features for working with other Microsoft server applications. [ETC](http://www.isaserver.org)

INSIDE INFO

- ISA Server 2006 home www.microsoft.com/isaserver/2006/default.mspx
- ISA Server unofficial home www.isaserver.org

PROVIEW

Experience the Difference

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5ms



22"
WIDE
5MS

MORE POWERFUL THAN A FORWARD FASTER THAN A WINGER

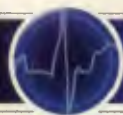
- Size: 22" Wide Display Area (mm) 410 x 256 • View Angle: 170°/160° • Dot Pitch(mm)0.282x0.282
- Resolution: 1680x1050, Response time: 5ms • Brightness: 300 Contrast: 700:1 • Color: Black • Display color: 16.7m

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Speed Machines

Dan Chiappini test-drives five of the hottest performance PC systems around — and then plays God with APC's very own creation.

No matter what sort of machine or operating system people cut their computing teeth on, the one universal want remains the same — to own a machine of the highest performance possible (and then some).

Our fascination with speed often goes far beyond what's currently attainable — it's human nature to want more than we can have, and it's one of the driving forces behind innovation. Unless you're the likes of NASA or a member of the Japanese Government looking into earthquake simulation, you're probably never going to get your hands on a Cray. Then again, if you are inclined, there's often a few old J90 units going cheap on eBay, not that they'd be any use for your everyday email checking and the odd game of Counter-Strike — but they may make an interesting talking piece in your lounge room.

Dell continues to drive down the cost of standard home PCs, and parents, first-timers and students can now grab a decent

little system for under \$1,000. But, we're bored with standard. Here at APC we're all about tomorrow's technology; wiping the salt out of our eyes with a hand crusted with thermal paste as we ride the wave of future tech.

So we thought we'd take a break from our scheduled programming and bring you something just a little extra special this month. We sent out the call for major players to send us something we'd want to buy and own, an all-out powerhouse that would require a power substation to run it. And what better time to do it than now with Intel's recently launched Core 2 product: the fastest CPU we've ever tested and the successor to the hugely popular Pentium series.

THE CONTENDERS

This Challenge had only a handful of minor requirements for entry: one PC per vendor; the system must include a monitor and operating system; and no price ceiling, leaving manufacturers to

run wild with their ideal performance PC.

In all, five companies rose to the challenge and sent us their best-of-breed systems: Plus Corporation, Altech, TI Computers, HP and Inspire Digital. The fact they were willing to go head-to-head in an all-out speed contest speaks volumes for the faith in their machinery.

Plus Corporation was the first to arrive, offering up the Plus Stealth III Gamer built into an ASUS Vento 7700 Extreme Gaming chassis. It looked more like the bastard child of an H.R. Giger design and a light rail vehicle than a PC case. That aside, it runs reasonably quietly and does a great job cooling the system. It has a couple of niggly, little quirks though — most notably the positioning of the front cover release next to the power button, causing a few unintended system power downs when trying to open it. Our other gripe is the placement of the hinge that secures the cover to the rest of the case, meaning

that if you're mounting your primary optical drive in the top bay, it becomes rather fiddly to get discs in and out of the tray.

Case choice aside, the system serves up Intel's brand-spanking-new Core 2 Extreme X6800 chip, the highest-performance and highest-priced part currently offered, clocking in at 2.93GHz with a massive 4MB L2 cache. Inside we also find two gigabytes of Corsair memory, Nvidia's top-of-the-line GeForce 7950 GX2 graphics (two 512MB 7900GTX's strapped together to become one card), a whopping 1.5 terabyte of storage care of a pair of Seagate 750GB drives in RAID 0 and a 20in wide-screen LCD monitor.

Altech was one of only two entries to opt for AMD's Athlon 64 FX-62 processor rather than Intel's Conroe (codename for the Core 2 Duo) chips. Like all the other machines, it included the same 2GB of memory, but took a slightly different route in the graphics department, including two Nvidia GeForce 7900GT cards in SLI, with

4

5

THE
playersfive
TESTED

VENDOR	MODEL	PRICE	ONLINE	PHONE
1. TI Computers	TI FX62 Extreme 4000	\$4,320	www.ticomputers.com.au	(02) 9437 5437
2. Altech	NRG Hydro	\$4,799	www.altech.com.au	(02) 8831 9999
3. Plus Corp.	Stealth III GAMER	\$6,799	www.pluscorp.com.au	1800 007 587
4. HP	xw8400 workstation	\$7,700	www.hp.com.au	13 13 47
5. Enspire	Lightspeed XPS	\$5,899	www.enspiredigital.com.au	1300 880 070

their stock fans removed and replaced with larger and quieter Zalman aftermarket coolers. The Antec PlusView II case used has removable bays for both hard disks and floppy drives but, once the system is built, longer length PCI Express graphics cards make it tough to remove the top cage compared to the ease of disk removal on the Enspire machine.

Like the TI system, Altech offers two 320GB Seagate SATA II drives in RAID 0 and gives buyers plenty of storage space and the associated performance.

Cooling is obviously on Altech's mind, their system packing four fans — one cooling the CPU, one on the front inside of the chassis to cool drives and components, one on the rear of the case to extract hot air from the CPU and one mounted on the Perspex window covering the left-hand side of the machine. Although both TI and Altech have clear side panels to show off the guts of the machine, only Altech went the extra mile to include internal lighting with red

LEDs mounted on the Fatal1ty motherboard and two of the fans. A 19in Samsung LCD rounds out the package nicely.

On closer examination we found that TI Computers' TI FX62 Extreme 4000 PC was a fairly standard high-performance system, with the only differentiation coming from its ComproDVB-T300 TV tuner. TI is very clearly targeting this machine towards gamers by including the Logitech MX3000 laser keyboard and mouse set because, as any serious gamer knows, a top-of-the-line PC is still limited by the input devices. Users should have no problem with this set though.

Like Plus Corp, TI opted to use a single Nvidia GeForce 7950 GX2. For those wanting to upgrade to quad-SLI TI has used an SLI-ready motherboard, giving users the option to go out and purchase an additional card later if they feel two isn't enough. Be warned though, the 430W power supply in the Thermaltake Soprano case may need replacing to ensure you have

enough juice to power the system.

HP has a great reputation in the consumer PC space, so we were intrigued when they offered to submit a machine, the xw8400 workstation, for review for a performance-focused Challenge. While we'd be surprised if anyone went out and bought one of these workstations for personal use, they would certainly have a few things to crow about. The machine boasts Intel's brand-new dual-core Xeon 5100 "Woodcrest" series processor, a 64-bit four-way box with two gigabytes (four 512MB DIMMs) of DDR 667 fully buffered ECC memory, with the machine able to take up a maximum of 64GB of memory. Our machine included two 73GB Serial Attached SCSI (SAS) drives, one with Windows XP Professional 32-bit, the other with Windows XP Professional x64 edition. Pulling out all the stops, this top-of-the-line graphics workstation also includes Nvidia's Quadro FX 3500 graphics, useful for CAD, 3D manipulation and scientific applications.

Enspire Digital came up with something really special, a machine that included possibly everything you need for home entertainment and gaming. Shipping with Intel's Core 2 E6700 chip factory overlocked from 2.66GHz to 3.4GHz, it has the same 4MB cache as the X6800 Extreme Edition, but at roughly half the retail price tag. On top of this, Enspire includes 2GB of OCZ PC-8000 memory, two massive 400GB hard disk drives in RAID 0 configuration for speed and capacity and a pair of ATI's 1900XT graphics cards in CrossFire. Wide-screen LCD monitors seem to be the order of the day, so they threw in a 20in version, a Logitech MX-3000 laser mouse and keyboard set as well as a 5.1 speaker set for good measure.

Enspire has specifically chosen Antec's P180 case so it could install three 120mm fans to cool the additional heat being produced by the overlocked CPU. Using fewer large fans also helps to keep the machine running quietly even under heavy load as the sheer surface area of the fan blades means they need to rotate less often to move the same amount of air as several smaller fans. The built-in sound-proofing of the P180 also helps with this and, as a result, the machine is nearly silent,

even during gaming and system-intensive sessions. The other nifty thing is the side-mounted disk drawer at the bottom, letting you remove a single thumb-screw and pull out the entire bay without disturbing other devices and letting you add or subtract drives as required. Unfortunately, the PSU is located at the bottom of the case and, while the cabling inside the Lightspeed XPS is probably the neatest we've seen, it's tough to easily swap out components like the graphics card.

ON YOUR PCMARKS...

Once we had received all of the machines on test, we set them up in our Labs. To ensure consistency across the board, we used the latest WHQL (Windows-certified and signed) graphics drivers on each machine. Since this Challenge wasn't designed to test performance in any single area (ie. gaming, desktop usage or multimedia content creation), we opted to test using *all three*.

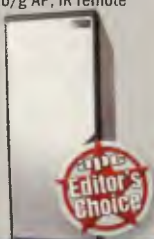
Realistically, the graphics cards in each machine were best-suited

towards entertainment like gaming, so we decided it would be unfair to penalise the HP machine just because it's designed to perform a workstation role.

PCMark05 (build 1.1.0) was the first test for each machine, with web browsing, content creation, 2D and 3D physics, word documents and virus scanning. PCMark takes into account system components such as faster disk drives, memory and, to some degree, the graphics sub-system. For this reason, it gives us the best

understanding of a system's overall performance.

On this test, Enspire's Lightspeed XPS rocketed out of the gate, jostling with HP all the way to the finish but eventually winning by a miniscule 180 marks. Despite the raw power of the Woodcrest-based HP workstation's dual-core dual-CPU, it was held back by the fully buffered ECC memory. ECC memory is preferable in workstations and servers as it continuously checks the data stream for errors and is able to

	ALTECH COMPUTERS ANTEC PLUSVIEW II	ENSPIRE DIGITAL	HP	PLUS CORPORATION	TI COMPUTERS
Chassis / brand type	Performance TX Gamer Show Case; Silverstone 750W PSU	Antec Performance One P180 with Fortunate Epsilon 700W PSU	HP proprietary ATX	ASUS Vento 7700 Extreme Gaming Case; Hiper Type-R Modular 580W PSU	Thermaltake Soprano Case
CPU brand / model	AMD Athlon 64 FX-62 processor	Intel Core 2 Duo E6700 overclocked to 3.4GHz	2x Intel Xeon 5100 "Woodcrest"	Intel Core 2 Extreme X6800	AMD Athlon 64 FX-62 processor
RAM brand / amount	Corsair Twin2X PC-6400 2GB (2x 1GB) DDR2 RAM	2GB OCZ DDR2 PC2-8000 Platinum Extreme Edition	4x 512MB DDR2 667MHz ECC	Corsair DDR2 TWIN2X2048-6400 (2GB 2x 1GB) RAM	2x 1GB PC5300 667MHz Apacer
HDD brand / capacity	2x Seagate 320GB SATA II 16MB Cache	2x Samsung 400GB SATA-II 8MB Cache	2x 73GB 15K SAS	2x Seagate 750GB SATA2 hard drives	2x Seagate 320G SATA II HDD 16MB Cache
Motherboard brand / model	ABIT Fatal1ty AN9 32X; Nvidia nForce 590 SLI	ASUS P5W-DH Deluxe Wi-Fi Intel 975X	HP proprietary; Intel 5000X GreenCreek chipset	ASUS P5W DH Deluxe	ASUS M2N 32 SLI Deluxe
Sound card brand / model	Integrated High-Definition Audio	Integrated High-Definition Audio	Integrated High-Definition Audio	Integrated High-Definition Audio	Integrated High-Definition Audio
Graphics card brand / model	2x XpertVision GF 7900GT SONIC 512MB	512MB ATI Radeon X1900 Cross + 512MB ATI Radeon X1900XTX CrossFire Mode	Nvidia Quadro FX3500	Leadtek Nvidia GeForce Windast PX7950GX2 1GB	Leadtek GeForce 7950GT
Monitor brand / model	Samsung 19in 940N LCD; 8ms response time	Viewsonic VX2025WM 20in; 8ms response time	HP LP2065 20in flat panel	NEC 20WGX2-BK 20in wide-screen	Viewsonic VX2025WM 20in; 8ms response time
Speakers brand / model	Creative SBS580 5.1	Logitech Z-5500D THX digital	None	Klipsch KP-GMXA21 3 piece multimedia	Logitech X230 2.1 with subwoofer
Keyboard brand / model	Microsoft Comfort Curve 2000 multimedia keyboard	Logitech MX-3000 wireless keyboard	Standard USB keyboard	Microsoft Wireless Laser Desktop 6000 USB	Logitech MX 3000 cordless keyboard
Mouse brand / model	Microsoft Comfort Curve 2000 optical wheel USB	Logitech MX-3000 laser mouse	Standard USB 2-button mouse	Microsoft Wireless Laser Desktop 6000 USB	Cordless Logitech optical wheel mouse
Operating system	Microsoft Windows XP Professional	Microsoft Windows XP Professional	Microsoft Windows 32 XP/64 XP	Microsoft Windows XP Professional	MS Windows XP Home
Included software	None	PC Cillin 2006 OEM 12-month subscription	None	Norton Anti-Virus; Trackmania Nations; Serious Sam	Serious Sam II; Trackmania Nations
Other	Multiformat card reader	Integrated wireless 802.11b/g AP; IR remote control	None	None	802.11b/g wireless adaptor; Videomate Compro DVB-T300 digital HDTV
					
					
					
Verdict	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆
	Good graphics performance.	Excellent all-round performance.	Workhorse CPU.	Huge storage capacity.	TV tuner.
	Poor multimedia performance.	Difficult case to work on.	Poor desktop graphic performance.	Expensive.	Poor multimedia and graphics performance.

correct failed bits in memory blocks. Unfortunately, constant monitoring of the memory does tend to slow it down and, even with its high PCMark score, it was no match for Enspire's unbuffered PC-8000 DIMMs. Even with memory slowing down its processing speed in favour of reliability, it still had a commanding lead over the 7,829 score posted by the X6800 in the Plus Corp machine.

Altech's FX-62-based system took third in PCMark05, posting 1,000 fewer points and suffering at the hands of the Core 2's supremacy. TI, the only other Athlon-based system, brought up the rear, slightly behind Altech and reinforcing that you get what you pay for with performance PCs.

GAMING

Gamers want best-of-breed tech and are willing to pay through the nose to get it. Given that each machine features the top-of-the-line graphics option from either Nvidia or ATI, it seemed logical to run these monsters through our usual benchmarking suite to gauge their ability to play games. 3DMark06 is a shader and geometry-heavy benchmark that gives us a very clear indication of the machine's performance running today's games and a rough look at how they'll perform for the next generation of games.

We ran the benchmark in both 1,280 x 1,024 default resolution without enabling anti-aliasing (AA) or anisotropic filtering (AF), and then a more intensive 1,600 x 1,200 again without AA or AF. Enspire topped both tests, posting a clear win in both resolutions with help

from its pair of ATI 1900XT cards in a CrossFire configuration. Altech was the only other company to send us a machine featuring two top-end graphics cards in tandem and convincingly took out second place ahead of the single cards from Plus and TI. HP's Quadro FX3500 stumbled a bit in the gaming component of our tests. Against 7950 GX2 cards packing 1GB of memory (512MB per GPU) and 512MB memory interfaces, the Quadro's 42.2GB/s memory bandwidth and 12 pixels per clock was dwarfed by its opponents' 76.8GB/s and 48-pixels-per-clock figures. That said though, we did fire up a few games on the HP xw8400 and they were still more than playable, even at around half the performance on paper.

Synthetic benchmarks are all well and good, but what we really wanted to look at was the real-world performance of these systems up against current-generation games. Quake 4 was perfect as it has a great built-in benchmark and the game engine still stresses top-end PCs, although it scales quite well on older hardware. We recorded a custom APC gameplay demo and ran three iterations of each per machine to determine the average framerate.

If you've got the hardware to do it, there's no reason why you wouldn't run anti-aliasing, so we tested each at 1,280 x 1,024 resolution (the maximum resolution supported by many 17 and 19in LCD monitors) and enabled four samples of full-scene anti-aliasing.

The results followed the trends set out by 3DMark06, seeing Enspire again leading the pack

with a whopping 114.8 frames per second, nearly fifteen frames ahead of Plus Corp's X6800-based system which moved up into second place. Altech and TI jostled for third place, pipping TI's Nvidia 7950 GX2 wielding system by a mere 3fps, a negligible margin at best. HP again brought up the rear, posting 60fps and, while significantly lower, is still more than enough to provide a smooth and playable gaming experience, if anyone would ever use it this way.

MULTIMEDIA

Our last test was designed to really stress the CPU and involved encoding and upscaling a 416MB AVI file into a 720p high-definition Windows Media 9 Video file.

Again Enspire shot to the lead and held it, turning in a blistering nine minutes, 31 seconds, and was the only machine to break the 10 minute mark. The combination of its overclocked E6700 CPU, around 28% faster than its stock shipping speed, combined with a huge 4MB L2 cache and high-performance memory helped it get across the line fastest. Plus Corp came in second, just shy of 11 minutes at 10:53. HP with its Woodcrest CPUs steamed into third place with 12:21, while Altech and TI brought up the rear at 13:49 and 14:06 respectively, several minutes off the pace with their seemingly last-generation FX-62 chips.

THE PICK

All of the entries certainly hit the performance bracket we were looking to showcase, but in terms of consistency of performance, Enspire's Lightspeed XPS machine was the only system to top every

test by a considerable margin. Its combination of an overclocked Core 2 processor, 2GB of high quality memory, the best part of a terabyte of storage and the fastest performing graphics available today makes this hard to go past for out-and-out speed. The bundled gaming-focused keyboard and mouse combo and a 20in wide-screen monitor really makes this a hell of a package. While certainly not the cheapest PC available, if you take your performance seriously and have the cash to back it, there's no finer example to be found here and as a result we've given it our Editor's Choice award.

Plus Corp was always a contender for the top position, even with its Nvidia 7950 GX2 card. We can't help but feel the card was its biggest downfall — either the addition of another GX2 or the move to a CrossFire setup may have made the results a little less favourable for the Enspire machine. Despite this, Plus Corp's offering was still packed with performance features, so we have awarded it our Highly Recommended medal.

Altech put on a good show, but never really differentiated itself from the pack, hovering around the middle-mark. Likewise, TI returned good scores, but against such stiff competition struggled to keep up.

HP, although a bit of a square peg in a round hole, does have plenty to brag about and, while you probably won't go out and buy one for your next upgrade, it certainly proved it's a great choice for its purpose — CAD and other manipulation tasks. 

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APC God Box

What does it take for an attempt at the PC speed world record? Have a look at the components we used to put together APC's own speed machine. . .

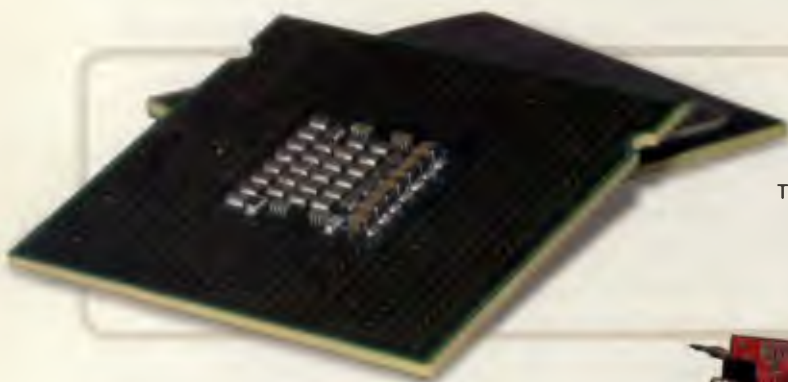
We were mightily impressed with all of the entries in our "Speed Machines" performance PCs Labs Challenge this month, but we decided we wanted more raw power! So we built our own Frankenstein-like PC from scratch. Assembling the best-of-breed components in each category, we put our box up against the contenders to see if we could eek out a bit more grunt — and edge past their monumental scores.



CPU

Intel Core 2 Duo Extreme Edition X6800

The absolute top of the Intel CPU pile, the new X6800 Extreme Edition chip is based on 65nm transistor density, featuring a massive 4MB of shared L2 cache, 1,066MHz FSB and clocking in at 2.93GHz. Extreme by name, extreme by price and extreme by performance.



Graphics card

ATI RADEON 1900XTX CrossFire Edition

You don't have to be good at maths to know that two 512MB top-notch graphics cards equals fast — very fast. The ATI is the current performance crown holder in the battle for your 3D dollars.



Memory

Corsair CM2X1024-6400C3 DDR2

Memory is important to any PC, but no more so than when trying to overclock your system. The difference between a big performance gain and an unstable, hot PC often comes down to your choice; this stuff is the goods with its low latency and high performance. Thank you to Altech Computers for supplying the memory for our God Box.



Motherboard

Intel D975XBX

Designed to support socket LGA775 chips, this Intel board has a 800-1,066MHz front side bus (FSB), 4 DDR2 DIMMs and two x16 PCI Express lanes for CrossFire graphics configurations. The perfect board for your new Core 2 Duo.



Power supply

Silverstone 750W

Serious performance needs a seriously beefy power supply. Silverstone's 750W model gives enough power to overclock our CPU beyond the manufacturer's rated speeds and still supply enough juice for a high-end graphics setup. Serious builders never skimp on their PSU.



Hard disk

Seagate Barracuda ST3750640AS 7200.10 SATA

There's a fine line between speed and decent storage. Never buy a cheap drive: in most cases it's the slowest component in your machine. 750GB is plenty of room for your applications and home movies. If you find it's too small, chuck in another one later and RAID them for more room.



Storage

Gigabyte I-RAM Solid State drive

If you're really after performance nirvana, there's no better option than dumping your OS on RAM. Fast boot times, super fast seeking and a constant 130MB/s can't be wrong. Just remember to factor in an additional couple of gigs of DDR to your system when purchasing.



Case

Lian Li PC S80

Designed to stay cool and still look hot, the S80 is an engineering masterpiece. Tool-less removable drive bays, ducted cooling to move hot air out of your system and insulated case panels will keep your machine cool and quiet. It's available in black or silver — you deserve better than beige boredom. A big thanks to Anyware Computers for supplying the Lian Li case this month.





DISCLAIMER: THIS PROJECT INVOLVED THE USE OF FLAMMABLE CHEMICALS AND WAS PERFORMED IN A WELL-VENTILATED SUPERVISED ENVIRONMENT. DO NOT ATTEMPT THIS AT HOME.

Crank it up: world record attempt

You'll be amazed at the crazy stuff required for a PC speed world record attempt. APC tried everything from ethanol baths to extreme water-cooling kits.

Having built our God Box and inspired by the fast PCs in the Challenge, we set out on a world record attempt. We were out to break the record of 14,430 PCMarks currently held by a German PC builder. Anyone can have a crack at the world record by running benchmark software from Futuremark and then submitting the results for verification at www.futuremark.com. There's even a free version of the benchmark to see how you compare.

Cooling was our biggest concern, as it always is with any attempt at seriously speeding up a PC. To get our system cold enough to cope with the shock of pushing it as hard as we were about to would

need some serious planning. After considering then striking out several options involving elaborate liquid nitrogen cooling, we eventually came to the conclusion that complete submersion of the system in a cooling liquid was the way to go. The big problem with liquid nitrogen is its one-shot nature, giving you enough cold for one attempt, but if you don't get it right you're left with a slowly evaporating mess of difficult-to-handle uselessness.

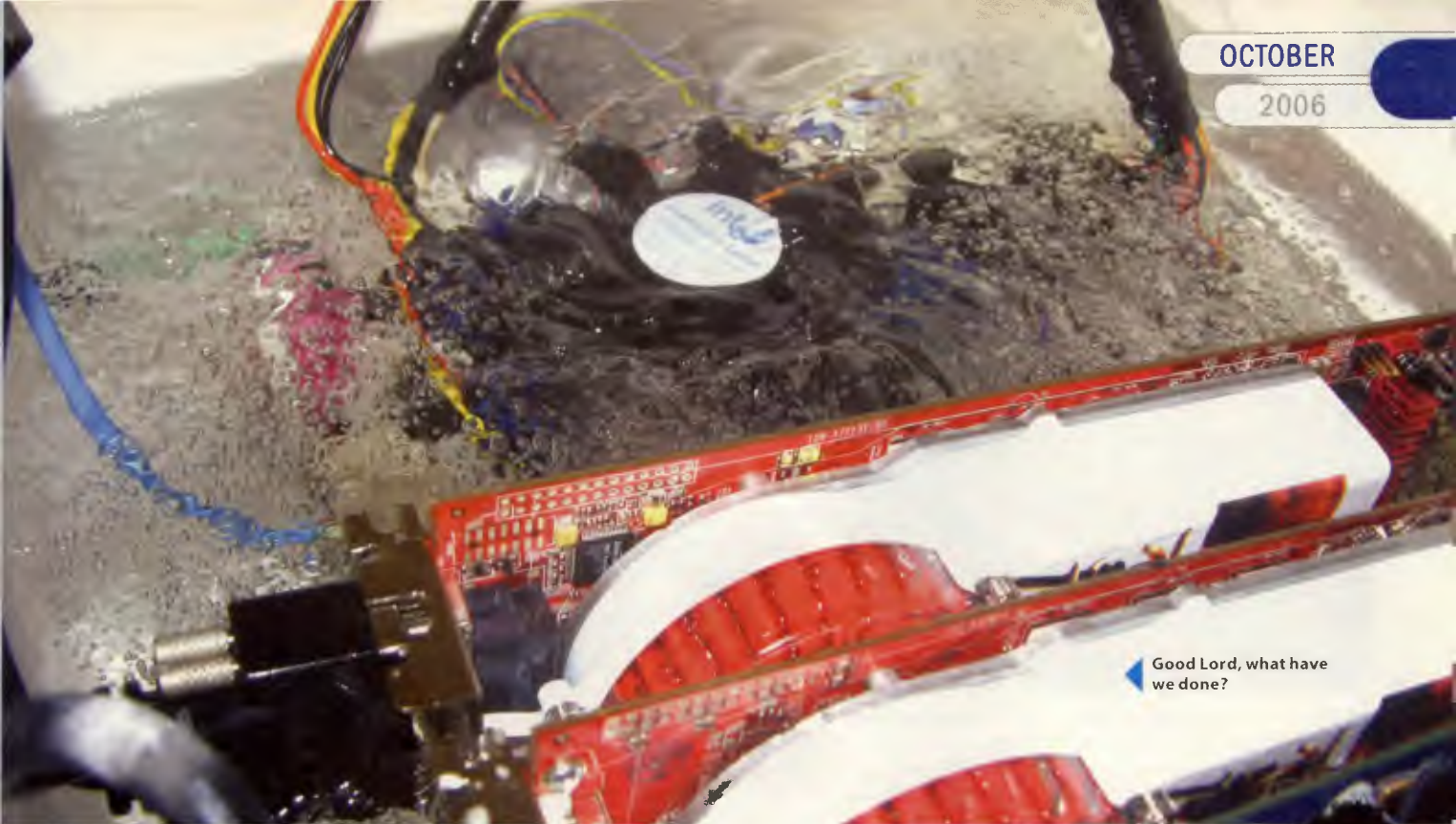
With liquid nitrogen out, we instead decided to use a combination of 100% ethanol (ethyl alcohol), and dry ice (frozen carbon dioxide), providing us with temperatures as low as minus 80

degrees Celsius without any nasty handling issues. The benefits of ethanol are that it's dielectric, meaning it doesn't conduct current (and as a result is an electrical insulator). Another option was to use mineral oil (not vegetable oil), which is petroleum-based. We opted for ethanol as it's readily available — not a controlled substance — and combined with dry ice makes for great cooling. Having said that, don't try this at home — as it still involves some very flammable chemicals.

The first step was to build a suitable bath for the system. We had a spare 20kg foam container (the kind you get at veggie shops) kicking around in the Labs.

Knowing how good eskies are at keeping beer cold, we decided polystyrene was the best home for our system.

With the machine booting on our test bench, we got down to business to see how fast we could run it air-cooled. Since the Intel Core 2 Extreme X6800 chips come multiplier-unlocked (also known as clock ratio), the CPU frequency is determined by multiplying the base frequency — in this case, 266 megahertz — by 11 to achieve 2.93GHz. We overclocked it to test the speed ceiling. We had no trouble getting it to the Enspire PC's 3.4GHz and it seemed to want to go higher. After encountering some stability issues (such as floating



Good Lord, what have we done?



WE POURED TEN LITRES OF ETHANOL INTO THE BOX, TRYING TO COME TO TERMS WITH SEEING A MOTHERBOARD FLOATING IN LIQUID

point calculation errors and unintended system restarts), we took the opposite approach and dropped the multiplier back a few ticks and kicked up the front side bus (FSB) to gauge the potential and to overclock the entire system rather than just the CPU.

We had no problems posting and booting Windows at 3.89GHz, but found that with the front side too high we were encountering stability problems completing key components of our PCMark05 run — specifically audio and video compression tests.

Intel's stock CPU cooler isn't bad, but we needed something a little beefier for this; so we gave it the flick in favour of Gigabyte's 3D Rocket cooler. Switching cooler made a huge difference and we managed to get the machine

running without any problems at 3.74GHz.

Now that we had a stable overclock, it was time to ready our system for a swim. We placed the board and all of its accessories into the polystyrene box, raising it slightly so the liquid would cool both sides of the board.

We did a final boot test in the box to make sure nothing had come loose in the move, then we removed the CPU cooler, as we thought the heatsink would cause more hindrance than good by stopping heat being properly dissipated away from the heat spreader on the top of the chip.

We poured ten litres of ethanol into the box, trying to come to terms with seeing a motherboard floating in liquid. Next, the dry ice went in, immediately bringing the

temperature down and beginning to fog like a cheap ghost-house ride.

Ready to go, we jumped the system manually by shorting the power pins on the board and waited. Nothing. The system seemed to be posting and going through the regular routine, but we were getting nothing on the monitor. After double then triple-checking cables, power and everything else possible, we powered it down.

Given that it was going through the motions but getting no



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display, it seemed logical to assume the problem was with the CrossFire cable, which had somehow become so cold that perhaps the solder within the cables (joining the DVI pins) had contracted and left us with complete internal disconnection.

Displeased but not defeated, we pulled the system out and replaced the motherboard with an ASUS P5N32-SLI SE Deluxe, a proven Conroe overclocker, and took the chance to replace the ATI cards with a pair of Nvidia's GeForce 7950 GX2 cards (for a total of four graphics cards).

After running through and stabilising another overclock, we were ready to have another crack at it. Just a word of advice: if you

ever find yourself working with ethanol — particularly 10 litres of the stuff — and you're standing over a box full of it for extended periods of time, don't try and drive afterwards. Although it's completely harmless to inhale, even in a well-ventilated area you may find your speech beginning to slur (and that familiar hazy feeling you get from a night down at your local pub). How many other magazines do you know of that'd put themselves through a self-imposed hangover for the sake of extreme computing?

Back to our experiment. After swapping the motherboard and graphics out, we tried booting the machine again. Nothing. Less than nothing. In fact, the system wasn't even posting anymore. A little dejected and feeling like a kebab and a lie down, we drained the

system and called it a night.

We left the parts for a few days to allow the ethanol to evaporate before trying anything else. Determined to post a record, we switched to more conventional water-cooling kits. We would not be denied. Fitting a Gigabyte water-cooling kit, we started overclocking and had it running at the same stable 3.74GHz as before. Plus, we overclocked the graphics cards about 100MHz either way.

Having posted close to 11,000 marks with air before moving to more serious cooling, we thought we had a good shot at breaking the record of 14,430 PCMarks. A few minor BIOS tweaks later and we posted our top score, 13,077, a resoundingly secure second

1 Water-cooled and running fine, now to box it up and chill it down.

2 It might look like toilet duck, but it's coolant, and not for drinking.

3 Drop in the dry ice and let's get some big numbers flowing.

place on the Futuremark forums. (Two and a half thousand marks above third place.)

So, we didn't break the world record, but this was pretty good. APC built the second fastest PC of all time as measured by the PCMark05 benchmark.

The lessons for users are that if you're going for speed, overclocking can yield some fantastic performance gains without buying the top-of-the-line hardware. While you don't necessarily need to go to the extremes, such as ethanol cooling — which isn't exactly a long-term method — great results can be had from air and water-cooling. Be warned though: you will sign away all your warranty rights as soon as you give it a go. [ETC](#)



What do you do with 5kg of extra dry ice?...



... you make an extra dry martini, Halloween style.

Here's that 10 litres of ethanol you ordered. Are you sure you want it on your PC?





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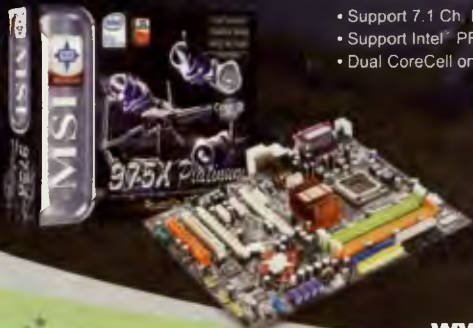
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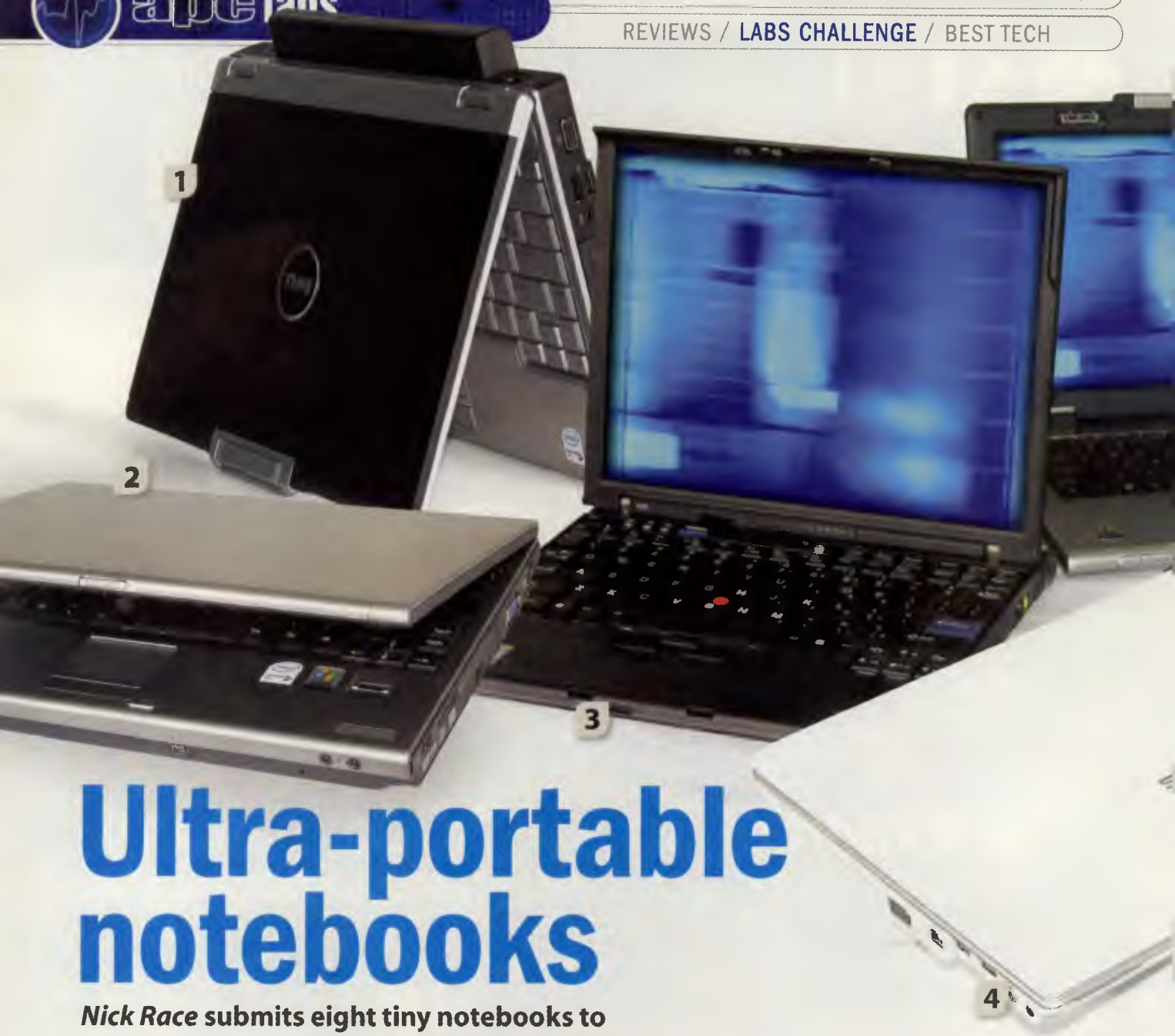
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Ultra-portable notebooks

Nick Race submits eight tiny notebooks to the ultimate battery-versus-power test.

As notebook markets mature, there's an overall tendency for people to purchase progressively smaller devices. The Japanese market, arguably the first to embrace portable computing, has seen the average screen size drop from 15in down to 14in and 13in, and is now witnessing a lion's share of the units at 12in and under. It makes sense, really. Once you're comfortable with the smaller form factor, you quickly tire of lugging around huge 15in units, preferring smaller and lighter notebooks with longer battery lives.

The real 15in killer is battery life. When you go smaller, you suddenly open up the possibility for major power saving. We wanted to put this to the test, so we rounded up small and light notebooks to see exactly what battery results you can expect and how big the trade-off is in terms of speed. We stipulated that each notebook had to be 13.3in or smaller, weigh less than 2kg and come with the standard battery as provided in the box.

We received units from Toshiba, HP, ASUS, BenQ, Dell, Sony, Lenovo

and Acer, with some surprising differences under the hood. The notebooks fall into two main categories: those built for speed, but smaller; and those built with extreme battery life in mind. This is the main trade-off evident when purchasing a new ultra-portable, and deciding which is more important — speed or battery life — will make adjusting to the new system much easier.

READY, SPEC — GO!

The usual suspects submitted some unusual systems. The first

that sets itself apart is the Compaq nc2400 from HP. This unit is a Core Solo (single core) U1400 CPU running at 1.2GHz. This low-voltage part does wonders for battery life.

The other systems were a mix of battery/features, with everything from 3-cell options to 9-cell batteries. Dell's XPS M1210 is one example of the trade-off. The machine recently graced our pages (APC September, page 42) and was resubmitted as Dell's flagship ultra-portable notebook for this Labs Challenge. Considering its excellent review last time, we



HOW WE TESTED

We put these notebooks on the bench to evaluate two main criteria: speed and battery life.

Speed testing was performed on all notebooks using PCMark05 from Futuremark. This is a well-rounded test of a PC or notebook's performance and includes CPU, memory and graphics subsystem tests to stress individual parts of a system to identify weaknesses.

Battery life was tested using BatteryMark. This benchmark puts the notebook under load on battery power and records battery lifespans over a number of runs. All notebooks were tested with the lowest screen brightness while keeping the backlight active, and with Wi-Fi and Bluetooth turned off.

accepted it with glee. With a 9-cell battery, it has the juice, but keep in mind power-sapping features like GeForce 7400 graphics.

Elsewhere, the IBM-branded Lenovo notebook was the smallest of the bunch, but that comes with a compromise. What it's missing is an internal optical drive; you'll need to use a USB optical drive to get data on or off via CD or DVD.

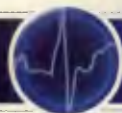
MEASURING UP

Our benchmarks showed us, without compromise, the great divide between battery life and

THE
players

eight
TESTED

VENDOR	MODEL	PRICE	ONLINE	PHONE
1. Dell	XPS M1210	\$3,499	www.dell.com.au	1800 812 393
2. Toshiba	Portege M500	\$2,750	www.isd.toshiba.com.au	13 30 70
3. Lenovo	ThinkPad X60	\$3,299	www.lenovo.com/au	1300 557 073
4. ASUS	U5F	\$2,699	www.asus.com.au	1300 278 788
5. Acer	TravelMate 3012	\$2,699	www.acer.com.au	1300 366 567
6. BenQ	JoyBook S61V49	\$2,499	www.benq.com.au	1300 130 336
7. HP	Compaq NC2400	\$3,299	www.hp.com.au	1300 305 018
8. Sony	VAIO VGN SZ25GP	\$2,999	www.sony.com.au	1300 137 669



processing power. Universally, notebooks that scored well in PCMark showed an average or poor result in BatteryMark and vice versa. Results in the battery life testing ranged from over eight hours to one and a half hours; a dramatic difference from similarly sized systems.

PCMark05 showed a very clear leader of the pack, with the Dell XPS M1210 earning a respectable 4,174 points. The combination of the GeForce Go 7400 discrete graphics solution combined with the top-of-the-line T2600 Core Duo processor was unbeatable. Second and third place-takers were the Sony with 3,392 and the ASUS U5F with 3,143, the Sony using GeForce Go 7400 from Nvidia and the ASUS U5F with the Intel 945 Extreme Graphics. In the case of the ASUS, the higher processor and 1GB of RAM were enough to propel it towards a good score.

Those that fell down under PCMark testing were the HP nc2400 and the Acer 3012, though, to be fair, the Acer still outsourced the HP by just under 1,000 points. The HP nc2400 only earned 1,565 points in PCMark due to the low power



▲ All in a row: this month's notebooks make an impressive line-up.

(but low-performance) Core Solo processor. Acer's 3012 scored 2,559 at the back end of the field, but still not a terrible score. BenQ, Lenovo and Toshiba all scored between 2,600 and 2,900, filling out the bulk of the pack.

Battery testing really separated the men from the boys, so to speak. At the bottom of the heap was Acer, lasting only one hour, 30 minutes (using our test settings). This is quite surprising considering

the 6-cell battery used for testing. When Acer's power management application was allowed to control the notebook when unplugged, we unofficially timed it at around 2.5 hours, so it's not as bad as it seems. Next up was the ASUS, one of the top scorers in PCMark. Here it only managed one hour, 47 minutes, but this time there was no excuse.

Sony and Dell came in next with two hours, 30 minutes for the Sony and three hours, 54 minutes from

the Dell. Both of these units use a discrete graphics solution that inevitably draws more power.

BenQ and Toshiba filled the middle of the pack, both with scores around four hours. (BenQ: four hours, 15 minutes; Toshiba: four hours, 25 minutes.) This is the ideal balance between battery life and processing power, and both notebooks fulfill the well-rounded role very well.

HP and Lenovo scored extremely well under BatteryMark. The HP nc2400 with the low-power Core Solo processor squeezed out six hours, nine minutes. Getting close to a full work day! Lenovo's X60 really excelled. The machine managed an astounding eight hours, 33 minutes under BatteryMark on our standard settings. Considering its reasonable performance as well, it would be incredibly hard to pass this unit up.

In conclusion, the Lenovo X60 did very, very, well in our tests overall. This ultra-thin unit packs the right combination of grunt and lasting power to ensure it will find many good homes in briefcases and backpacks around Australia.



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As you can see, just because they're smaller in size doesn't mean you're limited in choice.

BEST OF THE BUNCH

As a whole, the notebooks submitted for this Labs Challenge were good performers. None failed to achieve the tasks put to them and though there were a few low scores that resulted in raised eyebrows, these still fell within reason.

The Dell XPS M1210 earns our Highly Recommended bragging rights thanks to its huge grunt, though, with almost half the battery life of the Lenovo, it is a step down from top of the heap. After careful deliberation, we decided to award the Editor's Choice to the Lenovo ThinkPad

X60. The X60 has the right combination of power and outstanding battery life to ensure you can get the job done without hunting for a power point in the middle of the day. The business value of the X60 should not be underestimated, with security features like a Trusted Platform

Module for network identification, plus a biometric finger scanner for easy login or two-part authentication.

The only downside to this impressive unit is the lack of internal optical drive; though, at this size, it's not difficult to include a slim optical drive in a laptop bag. Considering it's also one of the lightest models in the roundup — even including its 8-cell battery — Lenovo has managed to fit some seriously good computing into a very small space. **ETC**

	ACER TRAVELMATE	BENQ JOYBOOK	SONY VAIO	LENOVO THINKPAD	TOSHIBA PORTEGE	ASUS USF	HP COMPAQ	DELL XPS
CPU	Intel Core Duo T2300	Intel Core Duo T2300	Intel Core Duo T2400	Intel Core Duo T2400	Intel Core Duo T2300	Intel Core Duo T2500	Intel Core Solo U1400	Intel Core Duo T2600
Memory	512MB	512MB	512MB	512MB	512MB	1GB	1GB	1GB
Memory speed	DDR2-667	DDR2-667	DDR2-667	DDR2-667	DDR2-667	DDR2-533	DDR2-533	DDR2-667
Chipset	Intel 945	Intel 945	Intel 945	Intel 945	Intel 945	Intel 945	Intel 945	Intel 945
Graphics chipset	Intel GMA 950	Intel GMA 950	Nvidia GeForce Go 7400	Intel GMA 950	Intel 945 Extreme Graphics	Intel GMA 950	Intel GMA 950	Nvidia GeForce Go 7400
Graphics memory	128MB shared	128MB shared	128MB shared	128MB shared	128MB shared	128MB shared	128MB shared	256MB shared
Wi-Fi	Intel 3495 ABG	Intel 3495 ABG	Intel 3495 ABG	Intel 3495 ABG	Intel 3495 ABG	Intel 3495 ABG	Intel 3495 ABG	Intel 3495 ABG
Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Screen size	12.1in	12.1in	13.3in	12.1in	12.1in	12.1in	12.1in	12.1in
USB	3	3	3	2	2	3	3	2
FireWire	1	1	1	1	1	1	1	1
Optical Int / Ext	External	Internal	Internal	External	Internal	Internal	Internal	Internal
Expansion slot	PC Card	ExpressCard	ExpressCard	PC Card	ExpressCard	PC Card	PC Card	ExpressCard
Weight	1.72kg	1.65kg	1.85kg	1.67kg	1.86kg	1.85kg	1.35kg	1.98kg
Standard battery	6-cell	3-cell	6-cell	8-cell	6-cell	6-cell	6-cell	9-cell



	Reasonable performance.	Great display; decent battery.	Great 3D graphics and performance.	Outstanding battery life	Good battery life.	1GB RAM; stylish.	Ultra-light; great battery life.	Powerful system; great performance.
	Poor battery life.	Could do with more RAM.	Needs longer battery life.	Needs ExpressCard.	Old graphics lets it down.	Where's the battery life?	Poor performance.	Needs more battery life.
Verdict	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★★

Introducing the new engin Voice Box series 3

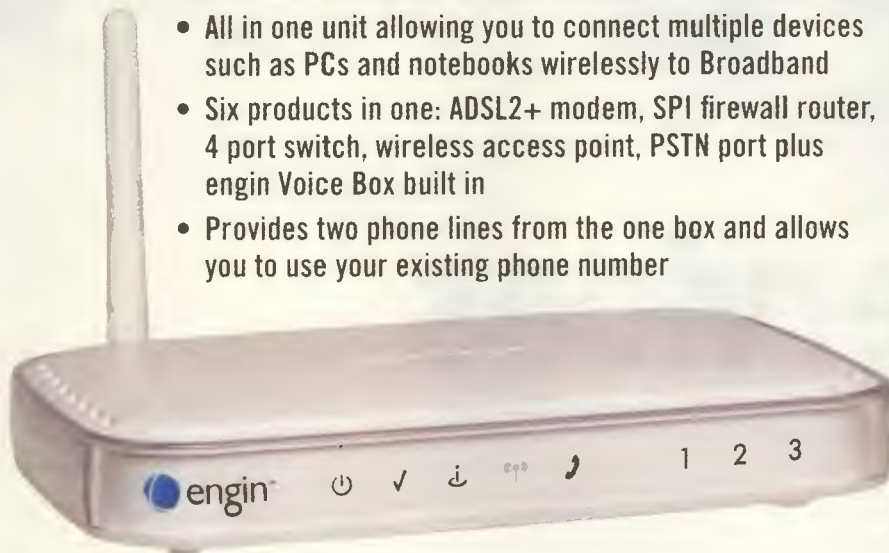
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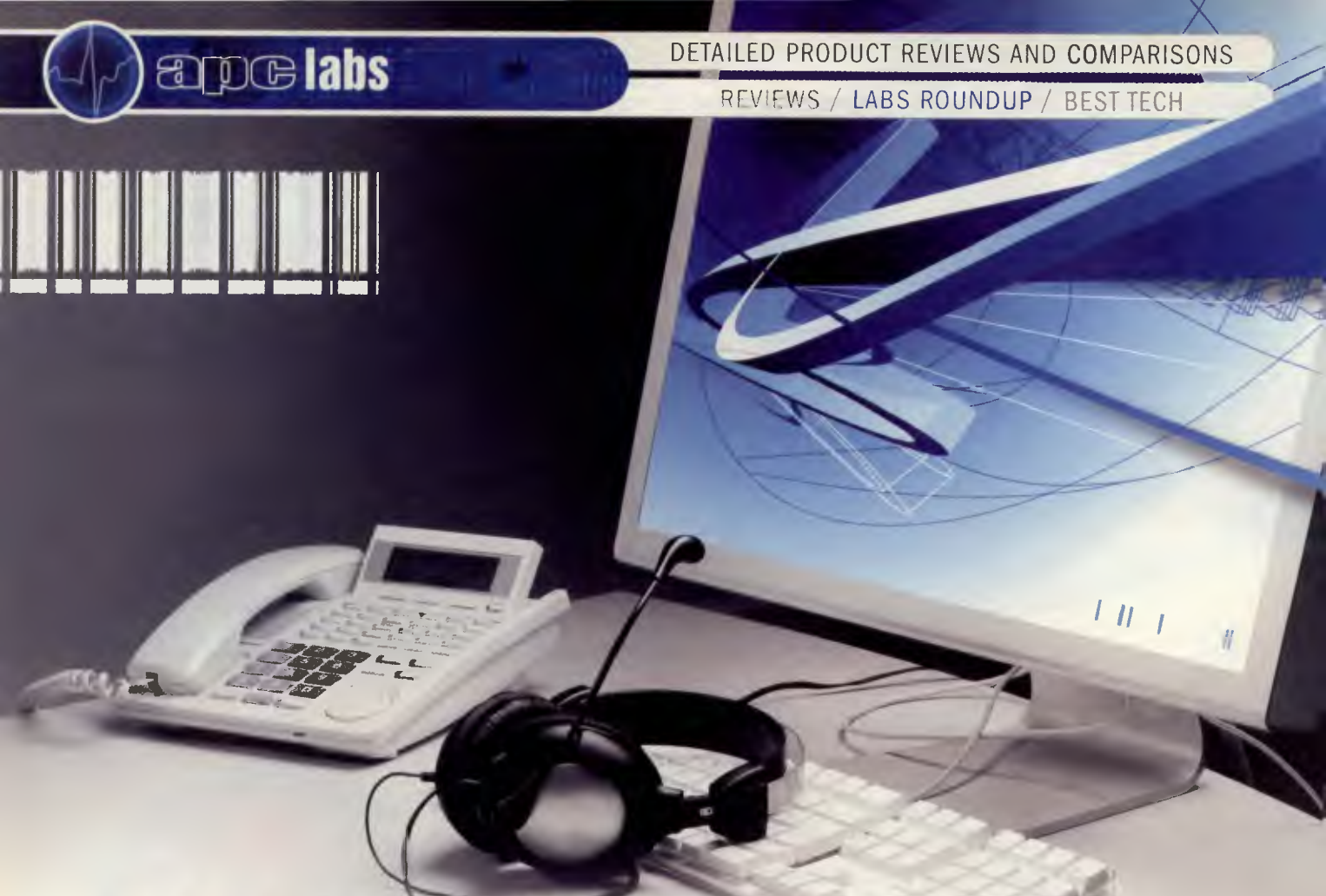
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SMALL BUSINESS VoIP services

Voice over IP systems can offer several advantages to small-to-medium businesses.

Stephen Withers rounds up the services from the major providers.

Previously at APC we've looked at VoIP from the perspective of domestic and micro-business users. This time, we're taking an overview of what's available for SMEs.

The main difference is that you're typically — though not necessarily — talking about products that move some of the processing to equipment on the customer's premises. The new generation of IP PABXs can be as

small as a paperback novel, and despite being priced around the same level as key systems (commonly referred to as Commander systems, even when they aren't from that vendor) they deliver the functions of a traditional PABX.

Your business might not want to throw out its existing telephony gear. It might make more sense to link the installed key system or PABX to VoIP in

order to get the benefits of cheaper calls in a non-disruptive manner, and then progressively add IP handsets where they are needed or train staff to use the new features where there is a good reason to do so.

You can expect providers or their partners to be able to supply and install new equipment, or connect your existing phone system to a VoIP service.

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CISCO SYSTEMS





THE NEW GENERATION OF IP PABXS CAN BE AS SMALL AS A PAPERBACK NOVEL AND STILL DELIVER THE TRADITIONAL FUNCTIONS

Some companies that we approached were so reluctant to talk about prices that we decided to leave them out of this feature. It's all very well talking about "value proposition", "converged networking" and so on but, if a company treats its call rates as if they were state secrets, we can't help wondering what they're hiding. Even if they are offering VoIP primarily as an add-on to other services and the infrastructure requirements would make their indicative pricing for installing a standalone VoIP service seem expensive, we can't think of a reason why their call charges shouldn't be comparable with those shown below.

On the other hand, it may be worth talking to your existing ISP, network provider or hosted applications provider to see what VoIP services they can offer. And if

you're a fairly heavy phone user and your main concern is costs rather than capabilities, give your existing carrier a chance to give you a better deal than they do at present.

We suggest that when a provider doesn't publish call charges (eg. on its web site), SMEs should take any rates offered as a basis for negotiation rather than a one-size-fits-all offer. Price isn't everything, but if all else is equal, why would you pay more?



PROVIDERS

AAPT

While AAPT offers a fully hosted VoIP system, the economics are such that it's not cost-effective for businesses with less than 100 or so staff.

Small businesses are offered the Business Connect service

that combines up to 12 phone lines with a DSL connection. This is currently sold as a bare service, with customers being responsible for the phone equipment on their premises, whether it comprises individual handsets, a key system or a PABX. If businesses want a complete package, AAPT also offers it under the iProvide brand through resellers who can also supply hardware to suit their customers' requirements.

Where a customer takes Business Connect at more than one location, calls between premises are free.

Unlimited broadband is also available as an add-on for \$6/line.

By November, the company expects to increase the maximum number of lines to somewhere in the 30-40 range and to add the ability to replace existing ISDN lines. This will be followed — probably by the end of the first quarter of 2007 — with bundles that will provide phone service

plus either a key system or a PABX plus handsets for a per-seat, per-month price.

BROADIP

BroadIP claims the ability to provide customised systems even for relatively small clients. For installations between two and 50 handsets, it normally recommends a hosted key system. This approach means all that needs to be installed at the client's premises are the IP phones, yet users still get features such as three-digit dialling between lines and three-way conference calling.

The company currently uses Mitel and Lucent equipment for this segment, but Linksys gear is under consideration. Rather than selling the handsets, BroadIP normally quotes a monthly fee including equipment rental, line termination and the first 200 minutes of calls per month.

If a client is happy with its existing phone system, BroadIP can install an IP gateway or ATAs



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Harvey Norman



For the easiest way to install VoIP, the best choice is a NetComm VoIP kit. It features a class-leading NetComm VoIP adaptor with a choice of pre-installed connection to leading VoIP service providers **MyNetFone** or **gotalk** (available for V100 and V300 models only). A NetComm VoIP kit is the easy, no-configuration needed way to install VoIP – simply connect it to your broadband equipment with a standard telephone and start calling!

A NetComm VoIP kit instantly turns your broadband connection into a telephone allowing you to call friends and family across town or around the world. You can call any type of phone (including mobiles) and you don't even need to switch your computer on to make calls – just pick up the phone and dial the number as normal.

For those who prefer to "tinker" or select their own VoIP provider, NetComm also offers do-it-yourself VoIP equipment that allows you to configure the solution to best meet your needs.

However you do it, VoIP will deliver massive savings to your telephone costs and make keeping in contact with loved ones just that little bit easier.

For further information, call (02) 9424 2070, go to www.netcomm.com.au or purchase your NetComm VoIP kit today from your nearest stockist.

* NetComm is not a VoIP service provider. It is your responsibility to choose a VoIP service provider and VoIP access plan which best suits your requirements. Any savings made compared to your current call costs are dependant upon the VoIP plan you select and any other fees that your VoIP service provider may charge.

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IF A COMPANY TREATS ITS CALL RATES AS IF THEY WERE STATE SECRETS, WE CAN'T HELP WONDERING WHAT THEY'RE HIDING

in order to provide access to its VoIP tariffs.

BroadIP also has a data arm, allowing it to guarantee quality of service unless clients choose a different ISP. The company recently announced an arrangement with Ucomm to deliver VoIP over the latter's fibre network. BroadIP is also pilot-testing a two-way satellite IP service for remote areas.

ENGIN

Although engin is sometimes seen as a domestic-oriented VoIP provider due to its presence in various major

chain stores, around 45 per cent of its customers are small to medium enterprises; this includes call centres and retailers.

Rather than trying to support this market directly, engin works with a network of over 300 dealers and value-added resellers that covers most capitals and regional cities. These businesses have established relationships with the big telephony vendors such as Avaya, NEC, Samsung and Panasonic, and can provide customers with systems to meet their needs.

In many cases, the cost savings that arise from switching to engin from a traditional carrier are enough to pay for a new phone system, but if the existing installation is still adequate, adaptors can be installed to link it with engin's service.

Engin's business plans start with Business 20, which offers 100 free untimed calls to fixed lines (10 cents/call thereafter), 23 cents/minute to mobiles and international calls from 3.5 cents/minute. The company will quote for fixed charges and call rates for multi-line installations.

GOTALK

Unlike most VoIP providers, gotalk is part of a group that operates a full-service phone network — parent company Telcorp handles over 20 per cent of outbound international calls. Consequently, gotalk can provide local number portability (although "conditions apply"), which is attractive to small businesses that want to sever connections with the major carriers but aren't prepared to risk losing trade through changing phone numbers and want to avoid the expense of reprinting business cards and other stationery.

The company's Business Broadband Voice plans also include not just one but five phone numbers in different geographical areas that map to one service. This is especially useful for businesses in fringe metro or regional areas, as it can put them in local call reach of more of their customers — gotalk takes pride in offering numbers in over 200 local call zones. Businesses with interstate customers can also benefit from this arrangement by selecting numbers in other

cities. Existing 1300 and 1800 numbers can also be terminated by gotalk, and the company includes a free 1300 number with its business plans.

One limitation is that the company's network of installers does not yet cover the whole country, but your current installer should be able to help businesses wishing to connect gotalk lines to their existing phone systems.

VDV COMMUNICATIONS

VDV's approach is to carry out a bill analysis for the prospective customer to determine the savings that can be made, identify the appropriate equipment and provide a lease quotation from a finance company. The company then supplies, installs and supports the equipment and resells VoIP services from ISPhone.

While VDV does offer a hosted service to micro-businesses, its normal practice is to install an IP PBX or gateway at the customer's premises. The company typically uses the Linksys Voice System for single premises and Asterisk to handle multiple locations such as home offices. It is also considering



WI-FI IP PHONES

While adaptors are available allowing the use of conventional phones or phone systems with VoIP services, there's a lot to be said for using IP phones with an IP PBX. For example, numbers are no longer linked to specific pieces of cable, so you don't need specialist help when you move people from one part of the building to another, and you'll generally get easier access to PBX features.

Wi-Fi VoIP phones represent a potentially very useful blend of technologies. Nokia has a couple of mobile phones that incorporate Wi-Fi capabilities, and companies such as

Zyxel and Hitachi offer handsets. But these may not be the companies that SMEs typically look to for ICT equipment — brand names such as D-Link, Linksys, NetComm and Netgear are more likely to be found on their network components.

Linksys is selling a pair of Wi-Fi handsets in the US, but they are still undergoing certification for use in Australia and a local release date hasn't been set. Both feature support for SIP and other standards, but the WIP300 provides SecureEasySetup for two-button WPA configuration, while the WIP330 incorporates a web browser allowing connection at commercial hotspots.

D-Link announced its DPH-540 Wi-Fi flip phone at CeBIT Sydney in May, but the local operation was unhappy with the firmware and delayed its release. It's now expected to go on sale by the end of the year.

Value-added: D-Link's upcoming flip phone offers wireless VoIP.

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*Draft 802.11n Specifications refers to draft version 1.0 March 2006; Netgear makes no commitments to upgradeability to ratified 802.11n and upload times are based on file transfers between PCs on the same network.



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adopting an Alloy system for smaller installations.

A typical VDV customer has between 12 and 15 handsets, and spends over \$1,000 per month on telephony.

VDV stresses the need for business-grade DSL links without contention — ie. the upstream bandwidth from the DSLAM is no less than the sum of the nominal bandwidth of the services connected to it. The company selected ISPhone as its wholesale VoIP provider as it offers good support and a

network that delivers good quality of service.

VOICE LOGIC

Voice Logic's focus is on the 5-25 seat market segment, although it can cater for organisations of two to 200 people using Asterisk-based systems, Linksys One or the Linksys Voice System. Its goal is to provide small businesses with the benefits of VoIP (as enjoyed by the corporate market), but at an affordable price.

The company's own VX-1 PABX provides up to 20 users with a

wide range of features including voice mail, IVR (interactive voice response), conferencing, unified messaging and support for remote users including mobile staff and telecommuters. It can be configured for ISDN and PSTN lines, allowing a progressive shift to VoIP carriage.

Where an existing phone system is considered adequate and the customer just wants VoIP for the cost savings on calls and lines, Voice Logic can install a gateway for as little as \$800. Blocks of PSTN numbers are

available, allowing direct indial to as many extensions as required.

Like other providers in this market, Voice Logic claims its service gives voice quality that matches conventional phone lines. Instead of using a private IP network to carry the traffic, Voice Systems uses the PSTN to carry calls between its points of presence and the final destination. The public internet is only used between the customer's premises and the POP. **APC**

	AAPT †	BROADIP	ENGIN §	GOTALK †	VDV COMMUNICATIONS	VOICE LOGIC
Small system*	¶	\$375/month (five handsets) #	§	^	\$3,500 (five handsets)	Under \$2,000 (five handsets)
Medium system*	¶	\$1,125/month (15 handsets) #	§	^	\$8,000 (16 handsets)	\$7,900 (15 handsets)
Large system*	¶	\$3,000/month (40 handsets) #	§	^	\$32,000 (40 high-end handsets)	\$28,000 (40 handsets including receptionist's console)
Local calls	9c	10c	10c	9.9c	12c	15c
National calls	7c/min	10c untimed	10c untimed	9.9c untimed	5c/min	15c untimed
Mobile calls (per min)	26c	25c	From 20c	From 21.9c	26.5c	29c/min
Call termination	\$25/line (1-5), \$20/line (6+)	Included in monthly fee	From \$5/line (if all free calls are used)	From \$9.95/line	From \$10/line	\$29.95 (five lines), \$49.95 (10), \$99.95 (50)
China (per min)	18c	3c	3.5c	1.9c	3.84c	3.85c
UK (per min)	8c	3c	3.5c	1.9c	3.36c	3.3c
US (per min)	8c	3c	3.5c	1.9c	3.84c	3.5c

* Representative prices only; includes handsets and installation. † Volume discounts apply when monthly call spend exceeds \$501. ¶ Complete systems not currently available from AAPT, but can be obtained from iProvide partners — see www.iprovide.com.au. # Hosted system; prices include termination and 200 outbound minutes per month per line. § Complete systems not sold by engin, but can be obtained from its value-added resellers — call 1300 305 000 for a referral. † Offers an alternative of 2c/min. timed local and national calls. ^ gotalk does not offer complete systems, but is evaluating potential partners for their supply and installation.

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1300 731 048 or visit **www.mynetfone.com.au/starterpack**

*The MyNetFone VoIP Starter Pack cannot be used with an existing MyNetFone account. For more details on plans and pricing, check www.mynetfone.com.au/plans/

BEST TECH



The **Best Overall** award is for products we believe are the best, regardless of price.



The **Best Value** award is for those which offer a good combination of features for a reasonable price.

APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market.

Best Tech is edited each month by William Maher. Contributors to the APC Best Tech guide: Seamus Byrne, Anthony Caruana, Dan Chiappini, John Gillooly, Nick Race, Adam Turner, Dan Warne and Stephen Withers.

HOME DESKTOPS

Plus Corporation Altera FX-60 Ultra 2

CONTACT Plus Corporation PHONE 1800 007 587
ONLINE www.pluscorp.com.au PRICE \$6,250



A real tour de force, centred around an AMD Athlon FX-60 dual-core CPU seated in an ASUS A8N32-SLI motherboard. Comes with an MSI GeForce 7800 GTX 256MB card, 2GB of RAM and two 500GB hard drives. It won the most benchmark tests in APC's last Megatest (April).

Dell Dimension 1100

CONTACT Dell PHONE 1800 812 393
ONLINE www.dell.com.au PRICE \$798



If there's one category that Dell does well, it's the bargain-basement entry-level machine. If you're not interested in games, then this system is a basic, no-frills winner. Our configuration includes Pentium 4 2.8GHz, 512MB RAM (with free upgrade) and a 48x DVD/CD-RW combo drive. The standout though is the 19in LCD.

BUSINESS DESKTOPS

Lenovo ThinkCentre M52

CONTACT Lenovo Australia PHONE 1300 557 073
ONLINE www.lenovo.com/au/en PRICE \$1,349



A state-of-the-art PC with a host of system management and rescue utilities, embedded security chip and integrated Gigabit Ethernet. Small form factor, a Pentium D 945 CPU (3.4GHz), 512MB RAM, 80GB hard disk and three year parts/labour warranty. Price does not include monitor.

HP dx5150 SFF Desktop PC

CONTACT HP PHONE 1300 305 017
ONLINE www.hp.com.au PRICE \$960



HP's dx5150 business desktop uses AMD's Athlon 64 X3000+ CPU on an ATI Radeon Xpress 200-based motherboard. The small form factor also packs a plain CD-ROM drive, 512MB of DDR400 RAM and an 80GB hard drive. Modest specs and a competitive price equal an excellent workhorse PC.

MOTHERBOARDS / CPU

Gigabyte GA-965P-DQ6

CONTACT Synnex PHONE 1300 100 100
ONLINE www.synnex.com.au PRICE \$489



Our new pick, when coupled with the fastest Conroe CPU (Core 2 Extreme X6800) makes for some solid grunt. Features include Quad eSATA2 and Quad Cooling with multiple heat sinks. Also included is dual PCI-E graphics support and dual-channel DDR2 800 memory.

Gigabyte GA-K8N-SLI

CONTACT Synnex PHONE 1300 100 100
ONLINE www.synnex.com.au PRICE \$199



The GA-K8N-SLI brings Nvidia's dual-graphics chipset to a reasonably priced motherboard. Enough functionality for a high-performing Athlon 64-based PC and the SLI slots only just lack the bandwidth for ultra high-end cards. You'll need a floppy drive to install Windows.

VIDEO CARDS

ATI Radeon X1900 XTX

CONTACT ATI
ONLINE www.ati.com

PHONE N/A
PRICE Approx. \$950



Current performance king and pinnacle of ATI's product line, the X1900 XTX delivers. No faster than a normal X1900 XT when used in dual-card CrossFire setups, but hands down the fastest single card on the market today with all the latest features, eg. Shader Model 3.0 support.

Nvidia GeForce 7600 GT

CONTACT Nvidia
ONLINE www.nvidia.com

PHONE N/A
PRICE Approx. \$375



Nvidia's recently released mainstream card, the GeForce 7600 GT raises the bar for price/performance. With significant performance boosts over the last-generation 6600 GT card, the 7600 GT also comes with support for SLI, allowing performance to spiral even higher.

MONITORS

LG M203WX

CONTACT LG
ONLINE www.lge.com.au

PHONE 1800 725 375
PRICE \$1,199



APC's pick from our latest LCD Labs roundup is this 20in stunner. A great mix of features, connectivity and picture quality, this unit proved to be a good all-round display in our testing. You get D-sub, DVI and USB ports — plus, it's one of the few we looked at with a multiformat card reader.

BenQ FP71G+

CONTACT BenQ
ONLINE www.benq.com.au

PHONE (02) 9352 8800
PRICE \$369



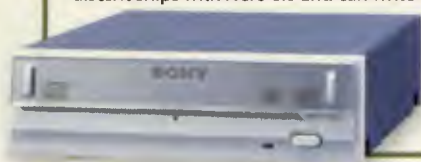
Proof that good things come in small packages, this 17in LCD screen manages to stay at a low price point while still delivering an 8ms response time. There's no DVI, but this 1,280 x 1,024 monitor will satisfy most run-of-the-mill computing jobs.

OPTICAL DRIVES

Sony DRU-820

CONTACT Sony
ONLINE www.sony.com.au

PHONE 1300 137 669
PRICE \$120

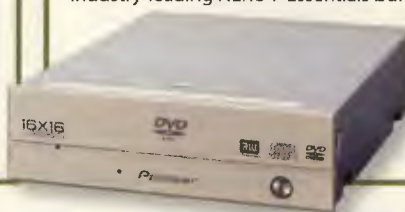


Sony's DRU-820 internal double-layer DVD burner is a ripper (if you'll excuse the pun), with support for DVD-RAM, DVD+/- and double-layer discs. It ships with Nero 6.6 and can write DVDs at up to 16x. A one-year warranty is included and the drive ships with both black and beige face-plates. An external model is also available for \$239.

Pioneer DVR-A11XLA

CONTACT Pioneer Electronics
ONLINE www.pioneeraus.com.au

PHONE 1800 338 439
PRICE \$99



Now on its 11th-generation release, this DVD burner is a steal at \$99. Industry-leading NERO 7 Essentials burning software is included and the drive itself offers a zippy 16x burn speed. The Pioneer drive is an excellent upgrade for an ageing system and a solid alternative to Sony's model.

INTERNAL HARD DISKS

Seagate Barracuda 7200.10 750GB

CONTACT Seagate
ONLINE www.seagate.com

PHONE (02) 9891 0087
PRICE \$980

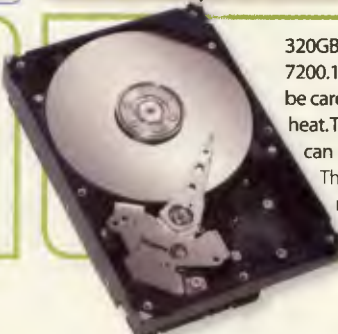


It may not be on the shelves when this issue of APC hits the streets, but it won't be too far off. This 750GB whopper scored well in our benchmarks and — just think about it — you only need two of these for 1.5TB of storage! It's available in PATA and SATA, but who uses PATA these days?

Seagate Barracuda 7200.10 320GB

CONTACT Synnex
ONLINE www.synnex.com.au

PHONE 1300 100 100
PRICE \$225



320GB is the new black. Seagate's Barracuda 7200.10 is quiet and packs plenty of punch, but be careful in tight enclosures: it puts out a load of heat. Though the RRP for this drive is \$225, they can be found on the street for less than \$200. The 16MB cache model is fast enough for most uses, but if you're serious about video editing, splurge for a 10,000rpm drive.

EXTERNAL HARD DISKS

Maxtor OneTouch III Turbo Edition

CONTACT Maxtor
ONLINE www.maxtor.com.au
PHONE (02) 9369 3662
PRICE \$1,199 (1TB)



Power users looking to store files safely are advised to check out this external hard disk. The device offers FireWire 800, Firewire 400, USB 2.0 interfaces and up to 1TB of storage. RAID 0 and 1 arrays are supported and it ships with desktop backup software — no worries about trashed files.

Western Digital My Book

CONTACT Synnex
ONLINE www.wdexternal.com.au
PHONE 1300 100 100
PRICE \$299



With more than double the capacity of our previous best value drive (which was also WD) at only a slightly higher cost, here you get 250GB of storage in a classy black enclosure equipped with Google Desktop software for quick file finding. It's got USB 2.0 (and the smart power-on/off feature is a nice touch).

FLASH DRIVES / MEMORY CARDS

Lexar Jumpdrive Lightning

CONTACT Lexar
ONLINE www.lexar.com.au
PHONE (02) 9034 8625
PRICE \$119.95 (1GB)



This ultra-quick Lexar functions like any other memory key, but includes a PowerToGo feature — you can install applications to the drive that can be run on any PC. It doesn't make any changes to the host OS and stores files locally on the key, so you can take it all with you when you leave; ideal for students or support staff. Support for 256-bit AES encryption is also included.

Sandisk Cruzer Micro

CONTACT Sandisk
ONLINE www.sandisk.com
PHONE 1800 793 652
PRICE \$99.95 (1GB)



Sandisk's Cruzer Micro is a top-notch USB memory key. The simple design includes a retractable USB connector and ships with a lanyard. The diminutive key includes the U3 software platform that allows users to install custom apps to the key — just like Lexar's PowerToGo feature. It's a touch slower than its competitor, but it's also \$20 cheaper for the 1GB capacity, and a good option for those that favour value over raw speed.

SERVERS – MEDIA / NAS

Iomega StorCenter Wireless Network 1TB

CONTACT Iomega
ONLINE www.iomega.com.au
PHONE 1800 466 342
PRICE \$1,999



The Iomega StorCenter provides a nominal terabyte of storage that can be configured as RAID 0, 1 or 5, plus Gigabit Ethernet, 802.11g wireless (WEP or WPA) and support for UPnP AV media players. Two USB ports enable connection for external drives, a shared printer or a digital camera.

Maxtor Shared Storage Plus

CONTACT Maxtor
ONLINE www.maxtor.com.au
PHONE (02) 9369 3662
PRICE \$399-\$699 (200GB-500GB)



Maxtor's Shared Storage Plus provides 200GB to 500GB of network storage, with the ability to stream media files to UPnP AV media adaptors — without the intervention of a PC. USB ports allow for connection of printers and external disk drives for additional storage.

SERVERS – SMALL BUSINESS SERVERS

HP ML350 G4P

CONTACT HP
ONLINE www.hp.com.au
PHONE 1300 305 017
PRICE From \$2,295



HP are the current kings of SMB x86 servers. Their ML300 series server has been upgraded with the latest, supporting two 800MHz FSB Xeons, 12GB of RAM and up to six SATA, SCSI or SAS 3.5in drives. For setting up an exchange server and terminal services (and to keep your office ticking), you can't go wrong.

Dell PowerEdge 1800

CONTACT Dell
ONLINE www.dell.com.au
PHONE 1800 812 392
PRICE \$1,897.50



For a basic system that will grow with your business, Dell's PowerEdge 1800 is a beauty. Though initial configuration is a single Xeon 3.0GHz with 512MB RAM and an 80GB SATA drive, you can upgrade it as your requirements grow. Redundant power and solid support come in at the ground floor.

NOTEBOOKS MULTIMEDIA

Sony Vaio VGNAR18GP

CONTACT Sony

PHONE 1300 137 669

ONLINE www.sony.com.au

PRICE \$5,499



It's not cheap, but if you're looking for one of the first Blu-ray-equipped notebooks, then this is it. You can burn and read the next-gen optical format (very slowly, mind you), as well as multiformat DVDs. Other highlights include the 160GB HDD, 3.8kg weight (lighter than Dell XPS M1710) and 17in-wide TFT.

Dell Inspiron 9400

CONTACT Dell

PHONE 1800 812 393

ONLINE www.dell.com.au

PRICE From \$3,500



Dell has a great reputation for offering affordable PCs without skimping on the tech inside. The 9400 is about as good as it gets and gives you mobile performance and gaming (GeForce 7800). Couple this with 1,920 x 1,200 display res and a high-definition TV tuner. Nice.

NOTEBOOKS BUSINESS

Lenovo ThinkPad R52

CONTACT Lenovo

PHONE 1300 557 073

ONLINE www.lenovo.com/au

PRICE From \$1,850



Serious road warriors need look no further. Built to outlast even the most demanding treatment, the R52 is also packed with smart tech to save your business, including biometric fingerprint scanner, power-on and disk passwords (to keep that sensitive data safe).

Dell Inspiron 1300

CONTACT Dell

PHONE 1800 812 393

ONLINE www.dell.com.au

PRICE From \$998



Whatever the size and nature of your business fleet, it's tough to go past Dell. While the business units don't have over-the-top specs, they're amply configured to deal with day-to-day work usage (and the bargain prices will only help sweeten the decision).

NOTEBOOKS ULTRAPORTABLE

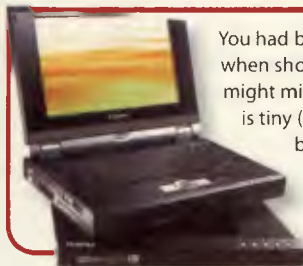
Toshiba Libretto

CONTACT Toshiba

PHONE 13 30 70

ONLINE www.isd.toshiba.com.au

PRICE From \$3,499



You had better make sure to look closely when shopping for a notebook or you might miss this one. At just 7.2in, the display is tiny (and the keyboard matches). Don't be fooled by the chassis though, there's plenty of grunt inside (and you can throw it into your backpack with room to spare).

Sony VGNTX27GPT

CONTACT Sony

PHONE 1300 138 246

ONLINE www.sony.com.au

PRICE \$3,699



The bigger brother of the TX17GP, we were blown away by its crisp display, tiny form factor and battery life. Able to run over eight hours on a single charge (and with an optional extended battery, there's no need to worry if you forget your charger).

HANDHELDS

iMate JasJar

CONTACT Carrier Devices

PHONE 1300 727 789

ONLINE www.clubimate.com

PRICE \$1,699



iMate's JasJar gets as close as any device that we've ever seen to being all things to all people. Sure, it's on the chunky side — but it's part tablet, part PDA and part phone. It's connected in just about any way you can imagine and if you spring for an extra \$50 you get a nice docking station.

O2 XDA Atom

CONTACT BrightPoint

PHONE 1300 300 213

ONLINE www.seeo2.com

PRICE \$1,229



O2's XDA Atom is small but packs plenty of punch. There were some early performance issues, but a recent ROM update fixed those. With Bluetooth, Wi-Fi, IR, Tri-band GSM and GPRS (and a bunch of office productivity apps), the Atom smartphone demonstrates that it's a great all-rounder.

PRINTERS – HOME

HP LaserJet 1020

CONTACT HP
ONLINE www.hp.com.au

PHONE 13 13 47
PRICE \$229



Households with serious printing needs are well served with a laser printer. HP's base-model LaserJet is ideal. Boasting a print speed of 14 pages per minute, a USB 2.0 interface and a monthly duty cycle of 5,000 pages, this diminutive HP unit will keep up no matter how much you throw at it.

Epson Stylus Photo R230 Colour Printer

CONTACT Epson
ONLINE www.epson.com.au

PHONE 1300 361 054
PRICE \$199



Has brought superb photo quality (previously found only in more expensive photo printers) to a sub-\$200 price range. With six ink cartridges, the R230 produces border-free prints on paper ranging from 4 x 6in to A4 (at up to 15ppm) and also prints directly to compatible CD/DVDs.

PRINTERS – SMALL BUSINESS

HP Officejet Pro K550

CONTACT HP
ONLINE www.hp.com.au

PHONE 1300 305 017
PRICE \$349



Total cost of ownership is the benchmark for business performance and the speedy K550 doesn't disappoint, with a USB interface and a 250-sheet tray, while four ink tanks minimise the time between cartridge changes. The 1,200dpi text output is remarkably quick and clear. An Ethernet port is provided on the K550dtn (for \$499).

Canon Laser Shot LBP-3000

CONTACT Canon
ONLINE www.canon.com.au

PHONE (02) 9805 2000
PRICE \$179



It's extremely easy to use and offers a print speed of around 14ppm, which should be adequate for most small businesses. With a single consumable, even the least tech-savvy users won't have a problem with maintenance. The 600 x 600dpi resolution is ample for spreadsheets and word processing.

MULTIFUNCTION – HOME

Canon Pixma MP830

CONTACT Canon
ONLINE www.canon.com.au

PHONE 1800 021 167
PRICE \$549



The MP780's successor, the MP830 soundly beats the competition. It can print photo-lab-quality 4 x 6in home snaps and has all the gear needed by a home office, such as a copier, scanner and G3 fax machine (together with an automatic 35-page document feeder and duplexing ability).

Lexmark X3350

CONTACT Lexmark
ONLINE www.lexmark.com.au

PHONE (02) 8401 3000
PRICE \$99



Anyone looking to occasionally print a school assignment, copy a form or scan a photo will find Lexmark's X3350 outstanding value for money. The grey unit even includes PictBridge support — but remember to keep an eye on consumable costs!

MULTIFUNCTION – SMALL BUSINESS

EPSON AcuLaser CX11NF

CONTACT EPSON
ONLINE www.epson.com.au

PHONE 1300 361 054
PRICE \$1,599



This colour laser multifunction printer won three of the six tests thrown at several MFCs in this month's Labs Challenge. Has good copy and scan speed, and does a great job with plain paper, where its fine detail and accurate colour impressed the judges. It can really replace your office printer, copier and fax machine.

Brother MFC-8860DN

CONTACT Brother
ONLINE www.brother.com.au

PHONE (02) 9887 4344
PRICE \$1,199



A mono (rather than colour) laser, this still has all the components to make it a powerful office or small department performer — such as a 28ppm network laser printer, a copier and a scanner with built-in duplexing, as well as LDAP capability (for accessing directory services). A great all-rounder for small businesses at the price.

ADSL MODEMS

Billion 7404VGP

CONTACT PC Range
ONLINE www.billion.com.au

PHONE (08) 8322 9544
PRICE \$299



It's hard to beat on features and price. For your \$299, you get one of the fastest ADSL2+ modems in terms of actual throughput (average over 1km and 3.5km phone line length), robust 802.11g wireless networking (supporting WPA2 security) and four Ethernet ports. There's inbuilt VoIP and PSTN passthrough (if the VoIP ever fails).

Billion 7300G

CONTACT PC Range
ONLINE www.billion.com.au

PHONE (08) 8322 9544
PRICE \$169



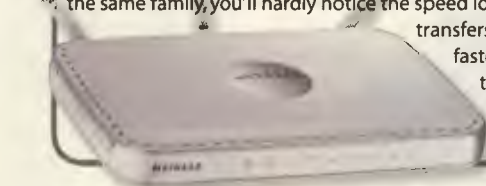
Despite its low price, the Billion 7300G managed to trump all the other modems in our most recent ADSL2+ Labs Challenge on average speed across 1km and 3.5km line lengths. It includes four 10/100 ports as well as 802.11g (including WEP, WPA and WPA-2 security). The modem has configurable Quality of Service, too.

WIRELESS ROUTERS

Netgear RangeMax 240 Wireless Router

CONTACT Netgear
ONLINE www.netgear.com.au

PHONE 1300 361 069
PRICE \$289



Going wireless usually means trading speed for convenience, but when the Netgear RangeMax 240 Wireless Router is used with an adaptor from the same family, you'll hardly notice the speed loss. Our testing found file transfers were around four times faster than 802.11g and less than 25 per cent slower than 100BaseT Ethernet.

Linksys WRT54G

CONTACT Linksys
ONLINE www.linksys.com.au

PHONE 1800 678 808
PRICE \$139.95



A solid, well-regarded wireless router. Includes a four-port Ethernet switch and an SPI firewall, but leaves out the extras that aren't needed by everybody, such as VPN, VoIP and print server. If you're on a tight budget, you might get better value from a modem/router combo.

VOIP ADAPTORS

Netcomm V300

CONTACT NetComm
ONLINE www.netcomm.com.au

PHONE (02) 9424 2070
PRICE \$199.10



Low upstream speeds on most broadband connections mean QoS support makes a big difference to how you sound during a VoIP call. In APC's testing, the V300 delivered good voice quality with minimum impact on data traffic. It also lets you use one handset for VoIP and PSTN calls.

Netcomm V100

CONTACT NetComm
ONLINE www.netcomm.com.au

PHONE (02) 9424 2070
PRICE \$128



Connect the V100 to a power point, your network and a handset, and you're in business. Available as a generic model or preconfigured for certain VoIP providers, which makes it as simple as it gets. Some people prefer a box that allows more diddling around, but we're attracted to the simplicity.

GPS DEVICES

TomTom Go500

CONTACT TomTom
ONLINE www.tomtom.com

PHONE N/A
PRICE \$1,099



Feature-rich and easy to use, the Go500 delivers a truckload of features that are so well put together you're scarcely aware of them all, plus, the Go500 acts as a wireless Bluetooth speakerphone for your mobile and route calculation is fast and easy to use. Brilliant.

Mio Digiwalker 136+

CONTACT Mio
ONLINE www.mio-tech.com.au

PHONE 1300 646 477
PRICE \$699



If you spend a lot of time on the road, the Mio 136+ might just pay for itself with over 600-fixed position speed and red-light cameras programmed into the mapping software (so you're warned before taking a hit). Easy to use, decent battery life and great price tag — what else do you want?



**INVESTIGATE...MONITOR...DETECT
ALERT...REPORT...LEARN**

NETWORK PROBLEMS SOLVED

Network and Application management for Small to Medium sized businesses is now elementary with Ipswitch WhatsUp Professional 2006 software.

WhatsUp ensures your critical business technology is working efficiently and effectively so you can concentrate on running your business. Isolate network problems before they occur. Discover and map network devices. Notify users when problems do occur. Gather network information over time and generate diagnostic reports. Deliver anytime, anywhere network management.

Quickly and easily installed, Ipswitch WhatsUp Professional 2006 will take your network to new levels of accountability and performance.

Take the first step to solve your network issues.
Call DNA on 1300 723 600 or visit
www.whatsup2006.com.au/apc



digital networks australia

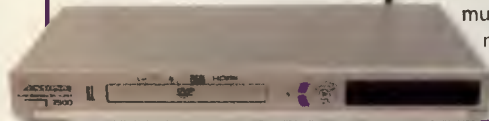
MEDIA ADAPTORS

Zenonic Z500 HD Network DVD player

CONTACT Zenonic PHONE (08) 8322 9544
ONLINE www.zenonic.com.au PRICE \$569



If you want to get your digital media from the study to the lounge room, the Z500 can handle anything you throw at it. It's a progressive-scan MPEG4/DVD player with HDCP-compatible HDMI, plus built-in Ethernet and 802.11b/g for streaming internet access and playing music, photos and movies from any PC on your home network.



Mediatek MG-350HD

CONTACT Anyware Computers PHONE (03) 9763 8200
ONLINE www.anyware.com.au PRICE \$399



The Mediatek MG-350HD is one of the simplest ways to get high-definition action into your lounge room (up to 1,080p resolution). Whack a desktop hard drive inside and the Mediatek plays just about any audio, video or image file you care to throw at it — from the drive or via Ethernet or Wi-Fi.



HD LCD TELEVISIONS

Philips Cineos 37PF9830/10

CONTACT Philips PHONE 1300 363 391
ONLINE www.philips.com.au PRICE \$5,999



Philips' 94cm (37in) Cineos offers an amazing 1,920 x 1,080 resolution, making it one of the few LCD TVs to do justice to the resolution in HD and Blu-ray movies. While it doesn't have a built-in digital tuner, it sports HDMI and HDCP-compatible DVI inputs for connecting to HD sources and also has a USB slot and multi-format card reader for playing JPEGs and MP3s.



Panasonic TX-27LWD500A

CONTACT Panasonic PHONE 13 26 00
ONLINE www.panasonic.com.au PRICE \$2,549



Built-in analogue/SD/HD tuners help the TX-27LWD500A stand out as an excellent starting point for getting HD action into your lounge room. Along with a 68cm wide-screen and HDCP compatible HDMI input, it's also got a 6-in-1 memory card reader.



PERSONAL VIDEO RECORDERS

Topfield TF5000PVRT Masterpiece

CONTACT Topfield PHONE 1300 889 803
ONLINE www.topfield.com.au PRICE \$999



If you're ready to revolutionise your TV viewing, this'll let you skip ads, pause live TV and record two programs at once. It sports twin SD digital tuners and a 160GB hard drive, plus the Ice TV Electronic Program Guide lets you "set and forget" the Masterpiece and never miss your favourite show again.



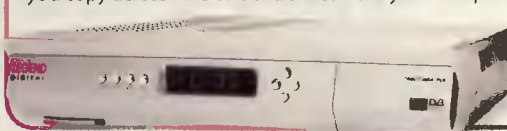
Legend Digital LPVR080

CONTACT Legend Digital PHONE (02) 8223 9656
ONLINE www.legenddigital.com PRICE \$600



The Legend Digital LPVR080 also sports twin standard-definition digital tuners along with an 80GB hard drive (up to 400GB is available). Along with PVR features like pausing live TV and ICE TV-compatibility, it lets you copy across MP3 and JPEG files from your computer via USB so

you can play them on your TV and stereo.



MP3 / MEDIA PLAYERS

Creative Zen Vision: M

CONTACT Creative PHONE (02) 9021 9800
ONLINE http://au.creative.com PRICE \$449 (not inc. power adapt.)



This may ruffle some feathers, but here it is: the Zen Vision: M has more than enough class to rival the iPod. It can do pretty much everything the iPod can do in terms of music, video and photos. Get this: 30GB drive, very sharp 2.5in screen, video playback, painless navigation, and it looks great. Our first choice for MP3.

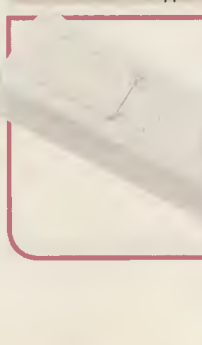


iPod Shuffle 1GB

CONTACT Apple PHONE 13 36 22
ONLINE www.apple.com.au PRICE \$149



Not a new product, but surprisingly still one of the more decent deals around when it comes to RRP prices for 1GB music players (check the web for street pricing though). There's no screen — and navigation features are very basic — but it only weighs 22g (so it's great for a jog or workout session).





Unwired and Telstra trade wireless insults

Wireless ISP Unwired has felt the scorn of Telstra after dropping the pricing of its wireless card for notebooks.

The company has introduced a new \$34.95 plan which offers a generous 600MB of usage at 256Kbit/s speed, added 200MB to the \$49.95 512Kbit/s plan and dropped the price of its top-end 12GB 750Kbit/s plan to \$109.95 — \$10 off.

In a cheeky press release, Unwired pointed out that anyone using 12GB on Telstra's wireless broadband service on a laptop card plan would be paying \$40,919.40 per year, while paying only \$1,199.40 on Unwired.

However, Telstra dismissed the claim as a stunt and said Unwired's pricing was still above the market average at the entry level.

"Everyone else with wireless broadband has a \$29 entry-level plan

— BigPond's is 10 hours of usage at 512Kbit/s and the others have 100 or 75MB caps, so Unwired is still priced above the market.

"The key thing with wireless cards is mobility. Unwired is no good to anyone outside the Sydney metro area or a small part of inner-city Melbourne. They will be getting very worried about Telstra's new mobile broadband network which next year will deliver broadband speeds wirelessly to 98% of the population."

In a related development, Vodafone announced it was introducing several plans for business users which would allow a phone handset to be used with a laptop as a wireless broadband modem.

Previously, Vodafone has barred users from combining its "data bundles" (prepaid blocks of data from 100MB to 1GB per month) with capped plans. It had only allowed these to be used with its Vodafone Mobile Connect PCMCIA cards.

The impact of the change is that anyone who needs wireless broadband no longer needs to purchase a special card — they can simply use their 3G phone via Bluetooth or a USB cable.

in brief

iiNET SCALES BACK DSLAM PLANS

If you were hoping for iiNet ADSL2+ in your area, you may be disappointed. iiNet has nixed 91 previously proposed exchanges from its ADSL rollout and delayed others till early next year. The company made the changes after a financial scare that saw its shares suspended from trading, which the company blamed on accounting errors. It says it will now focus on getting as many customers as possible moved off Telstra broadband and onto its own DSLAMs in areas into which it has already deployed.

your monthly broadband guide

APC is proud to partner with the independent broadband price-monitoring service Broadband Choice (broadbandchoice.com.au) to bring you the best ADSL and cable deals.

The comparison table on the following pages focuses on internet service providers that best serve the majority of APC readers' needs — those that have national coverage (though we have included some ISPs that provide higher than 2Mbit/s speed services in limited areas).

Only those meeting at least three of our four plan selection criteria are listed:

Budget plan: cheapest deal under \$35/month.

Light plan: cheapest deal under \$60/month, with at least 512Kbit/s speed and 1GB data.

Family plan: largest download allowance under \$80/month, at least 512Kbit/s and 10GB data.

High-speed: cheapest 1.5Mbit/s plan under \$100/month, with 10GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as its limit.

APC has picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest-priced option was selected.

The installation price doesn't include a modem because you may find you'll get better value by buying one separately.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet the selection criteria. There may be ISPs we didn't list that will provide better deals (but which only service your local area or state).

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details on how to become part of the database.

Data for our table was extracted from the Broadband Choice database on 2 August 2006.

OUR US LINK MAY GET A SPEED BOOST

Australia's major link to the USA, Southern Cross Cable, a fibre-optic under-sea cable, may get an upgrade to twice its current speed (240Mbit/s). The cable is a joint venture between Telecom New Zealand, SingTel Optus and US telco Verizon. It carries about 80% of Australian internet traffic to the US.



Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kbit/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kbit/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mbit/s, minimum 10GB data limit)	National	Spam filtering	Setup fee & contract length	Rapid transfer
Super-fast broadband ISPs (faster than 1.5Mbit/s)										
iNet broadband2+ ADSL (24Mbit/s)	13 19 17	www.inet.net.au	\$29.95† 600MB 24Mbit/s	\$39.95† 4GB+ 24Mbit/s	\$69.95† 20GB+ 24Mbit/s	\$49.95† 10GB+ 24Mbit/s	✓	✓	\$119 6mths	✓
Internode Extreme ADSL2+	13 66 33	www.internode.on.net	N/A	\$59.95 20GB 24Mbit/s	\$79.95 40GB 24Mbit/s	\$59.95 20GB 24Mbit/s	✓	✓	\$129 6mths	✓
iPrimus up to 8000Kbps	1300 854 848	www.iprimus.com.au	\$29.95† 1GB 8Mbit/s	\$29.95† 1GB 8Mbit/s	\$69.95† 20GB 8Mbit/s	\$49.95† 10GB 8Mbit/s	✓	\$2	\$119 12mths	✓
OptusNet Cable	1800 504 504	http://broadbandsales optusnet.com.au	\$29.95† 300MB+ 9.765625Mbit/s	\$39.95† 2GB+ 9.765625Mbit/s	\$69.95† 20GB+ 9.765625Mbit/s	\$69.95† 20GB+ 9.765625Mbit/s	✓	✓	\$89 12mths	✓
OptusNet DSL Direct	1800 504 504	http://broadbandsales. optusnet.com.au	\$29.95† 300MB+ 24Mbit/s	\$39.95† 2GB+ 24Mbit/s	\$69.95† 20GB+ 24Mbit/s	\$69.95† 20GB+ 24Mbit/s	✓	✓	\$89 12mths	✓
People Telecom ADSL2+	1300 795 833	www.peopletelecom.com.au	N/A	\$49.95† 10GB 24Mbit/s	\$69.95† 25GB 24Mbit/s	\$49.95† 10GB 24Mbit/s	✓	✓	\$99 12mths	✓
Telstra BigPond Cable	13 12 82	www.bigpond.com	\$29.95* 200MB^ 8Mbit/s	\$59.95† 10GB^ 8Mbit/s	\$59.95† 10GB^ 8Mbit/s	\$59.95† 10GB^ 8Mbit/s	✓	\$2.50	\$189 12mths#	✓
TPG Residential ADSL2+	1300 360 855	www.tpg.com.au	\$29.99* 600MB 24Mbit/s	\$49.99 18GB 24Mbit/s	\$59.99 30GB 24Mbit/s	\$49.99 18GB 24Mbit/s	✓	✓	\$59.95 12mths	✓
Regular broadband ISPs (1.5Mbit/s or less)										
1 2 3 ADSL	1300 885 646	www.123.net.au	\$29.99† 200MB 256Kbit/s	\$49.99† 1.5GB 512Kbit/s	\$69.99† No limit 512Kbit/s	N/A	✓	✓	\$129 6mths	✓
AAPT ADSL	13 88 88	www.aapt.com.au	\$29† 500MB 256Kbit/s	\$39† 12GB 512Kbit/s	\$59† 15GB 1.5Mbit/s	\$59† 15GB 1.5Mbit/s	✓	✓	\$0 1mth	✓
Alphalink	1300 360 638	http://home.alphalink.com.au	\$29.70* 200MB 256Kbit/s	\$44.90 1GB 512Kbit/s	\$69.90 10GB 512Kbit/s	\$99.90 10GB 1.5Mbit/s	✓	✓	\$121 1mth	✓
Australia On Line ADSL	1300 650 661	www.australiaonline.net.au	\$16.95* 200MB 256Kbit/s	\$39.95 2GB 512Kbit/s	\$54.95 No limit 512Kbit/s	\$79.95 No limit 1.5Mbit/s	✓	✓	\$59.95 6mths	✓
Australis Internet ADSL	1800 288 871	www.australis.net	\$24.95* 200MB 256Kbit/s	\$49.95 5GB 512Kbit/s	\$54.95 25GB 512Kbit/s	\$79.95 10GB 1.5Mbit/s	✓	✓	\$169 1mth	✓
BIT.net	1300 248 638	www.bit.net.au	\$29.95 2GB 256Kbit/s	\$39.95 2GB 512Kbit/s	\$79.95 40GB 512Kbit/s	\$69.95 10GB 1.5Mbit/s	✓	✓	\$132 6mths	✓
BKB Internet Residential ADSL	1800 252 638	www.bkb.net.au	N/A	\$49.95 1GB 512Kbit/s	\$69.95 10GB 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	✓	\$139 6mths	✓
Blackstump ADSL	1800 890 600	www.blackstump.net.au	\$19.95† 200MB 256Kbit/s	\$44.95† 5GB 512Kbit/s	\$55.95† No limit 512Kbit/s	\$72.45† 10GB 1.5Mbit/s	✓	✓	\$108 6mths	✓
BBi Flat Rate DSL	1300 785 956	www.brownbear.net.au	\$32.95 2GB 256Kbit/s	\$39.95 2GB 512Kbit/s	\$74.95 60GB 512Kbit/s	\$81.95 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
BBi Excess DSL	1300 785 956	www.brownbear.net.au	\$32.95* 2GB 256Kbit/s	\$39.95* 2GB 512Kbit/s	\$74.95* 60GB 512Kbit/s	\$81.95* 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
Brown Bear DSL/Phone	1300 785 956	www.brownbear.net.au	\$27.95† 2GB 256Kbit/s	\$34.95† 2GB 512Kbit/s	\$69.95† 60GB 512Kbit/s	\$76.95† 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
CEInternet Broadband	1800 222 256	www.ceinternet.com.au	\$29.95* 200MB 256Kbit/s	N/A	\$79.95 10GB 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	\$2.50	\$99 1mth	✓
Comcen Internet	1300 300 324	www.comcen.com.au	\$19.99* 200MB 256Kbit/s	\$39.99* 1GB+ 512Kbit/s	\$79.99 No limit 512Kbit/s	\$69.99* 15GB+ 1.5Mbit/s	✓	✓	\$99 6mths	✓
ComeOnAussie Turbo ADSL	1300 361 317	www.comeonaussie.net	\$34.95 15GB 256Kbit/s	\$44.95 25GB 512Kbit/s	\$44.95 25GB 512Kbit/s	\$86.95 35GB 1.5Mbit/s	✓	✓	\$108 1mth	✓
Concept Networks Stamina	1300 132 331	www.conceptual.net.au	\$29.95* 250MB 256Kbit/s	\$59.95* 16GB 512Kbit/s	\$69.95 No limit 512Kbit/s	N/A	✓	✓	\$99 6mths	✓
Connexus Home ADSL	1300 133 888	www.connexus.net.au	\$27.95* 200MB^ 256Kbit/s	\$59.95 10GB^ 512Kbit/s	\$59.95 10GB^ 512Kbit/s	N/A	✓	✓	\$149 6mths	✓
Crazy Broadband	1300 248 638	www.crazy.com.au	\$29.95* 250MB 256Kbit/s	\$42.95 2GB 512Kbit/s	\$49.95 20GB 512Kbit/s	\$82.95 20GB 1.5Mbit/s	✓	✓	\$140 6mths	✓
CyberOne ADSL	1300 720 062	www.cyberone.com.au	\$15.95* 200MB 256Kbit/s	\$54.95 No limit 512Kbit/s	\$54.95 No limit 512Kbit/s	\$84.95 No limit 1.5Mbit/s	✓	✓	\$0 1mth	✓
DCSI	1300 665 575	www.dcsi.net.au	\$29.95 500MB 256Kbit/s	\$49.95 10GB 512Kbit/s	\$59.95 20GB 512Kbit/s	\$79.95 20GB 1.5Mbit/s	✓	✓	\$125 6mths	✓
DigiPlus	1300 765 600	www.digiplus.com.au	N/A	\$42.95† 5GB 512Kbit/s	\$74.95 10GB 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	✓	\$99 1mth	✓
Dodo	13 24 73	www.dodo.com.au	\$19.90† 250MB^ 256Kbit/s	\$34.90† 1GB^ 512Kbit/s	\$44.90† No limit 512Kbit/s	\$64.90† 30GB^ 1.5Mbit/s	✓	\$1.90	\$119 1mth	✓
EFTel ADSL	1300 550 550	http://w3.elftel.com	\$29.95† 400MB^ 256Kbit/s	\$49.95† No limit 512Kbit/s	\$49.95† No limit 512Kbit/s	\$79.95† 40GB 1.5Mbit/s	✓	\$4	\$125 1mth	✓
Empcom ADSL	1300 731 368	www.empcom.net	\$30 1GB 256Kbit/s	\$40 1GB 512Kbit/s	\$65 No limit 512Kbit/s	\$85 10GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
eTelecom ADSL	1300 303 217	www.etelecom.com.au	\$19.95† 200MB 256Kbit/s	\$39.95† 1GB 512Kbit/s	\$69.95† 15GB 1.5Mbit/s	\$69.95† 15GB 1.5Mbit/s	✓	✓	\$99 12mths	✓
Gday.net ADSL Broadband	1300 668 640	http://telecom.gday.net	\$24.95* 300MB^ 256Kbit/s	N/A	\$69.95 10GB^ 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	✓	\$129 1mth	✓
Global Dial ZapDSL	1300 130 710	www.globaldial.com	\$29.95* 300MB 256Kbit/s	\$49.95 2GB+ 512Kbit/s	\$79.95 No limit 512Kbit/s	\$89.95 14GB+ 1.5Mbit/s	✓	✓	\$99 6mths	✓
Glocomm Broadband - ADSL	1300 728 392	www.glocomm.net.au	\$32.95* 500MB 256Kbit/s	\$46.95* 3GB 512Kbit/s	\$72.95 35GB 1.5Mbit/s	\$72.95 35GB 1.5Mbit/s	✓	✓	\$179 1mth	✓
Goldlink ADSL	1300 654 024	www.goldlink.com.au	N/A	\$49.95 25GB 512Kbit/s	\$74.95 35GB 1.5Mbit/s	\$74.95 35GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Goldweb ADSL	1300 366 065	www.goldweb.com.au	\$29.95* 200MB 256Kbit/s	\$55 1.5GB 512Kbit/s	\$80 15GB 512Kbit/s	N/A	✓	✓	\$139 1mth	✓
Hylinx ADSL	1300 132 014	www.hylinx.com	N/A	\$48.95† 25GB 512Kbit/s	\$48.95† 25GB 512Kbit/s	\$88.95† 35GB 1.5Mbit/s	✓	✓	\$129 1mth	✓
iNet broadband1 ADSL	13 19 17	www.inet.net.au	\$29.95† 600MB 512Kbit/s	\$39.95† 4GB+ 512Kbit/s	\$49.95† 10GB+ 512Kbit/s	N/A	✓	✓	\$119 6mths	✓
Infinity Plus Residential DSL	1300 726 340	www.infinityplus.net.au	N/A	\$49.95† 25GB 512Kbit/s	\$79.95† 30GB 1.5Mbit/s	\$79.95† 30GB 1.5Mbit/s	✓	✓	\$100 6mths	✓
Instant Communications ADSL	1300 139 369	www.in.com.au	\$30* 200MB 256Kbit/s	\$52 5GB 512Kbit/s	\$73* 20GB 512Kbit/s	\$87* 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
IntegrityNet ADSL	1300 884 337	www.integritynet.com.au	\$29.95* 200MB 256Kbit/s	\$59.95* 5GB 512Kbit/s	\$69.95* 10GB 512Kbit/s	\$99.95* 10GB 1.5Mbit/s	✓	✓	\$139 12mths	✓
Internode Home ADSL	13 66 33	www.internode.on.net	\$29.95 500MB 256Kbit/s	\$39.95 8GB 512Kbit/s	\$69.95 40GB 512Kbit/s	\$59.95 10GB 1.5Mbit/s	✓	✓	\$129 6mths	✓

Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kbit/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kbit/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mbit/s, minimum 10GB data limit)	National	Spam filtering	Setup fee & contract length	Rapid transfer
Regular broadband ISPs (1.5Mbit/s or less)										
Internode SOHO ADSL	13 66 33	www.internode.on.net	N/A	\$59.95 10GB 512Kbit/s	\$69.95 20GB 512Kbit/s	\$79.95 10GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
iPrimus Flexible Broadband	1300 854 848	www.iprimus.com.au	\$19.95† 500MB 256Kbit/s	\$29.95† 1GB 512Kbit/s	\$69.95† 20GB 1.5Mbit/s	\$59.95† 12GB 1.5Mbit/s	✓	\$2	\$119 12mths	✗
iSage Internet ADSL	1300 725 789	www.isage.aunz.net	\$34.95 15GB 256Kbit/s	\$44.95 25GB 512Kbit/s	\$44.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$99 1mth	✓
Ispace ADSL	1800 264 246	www.ispace.net.au	\$29.95* 200MB 256Kbit/s	\$49.95 5GB 512Kbit/s	\$69.95 35GB 512Kbit/s	\$89.95 15GB 1.5Mbit/s	✓	✓	\$120 6mths	✓
ADSL Broadband	1300 663 484	www.itginternet.net.au	\$31.79* 200MB 256Kbit/s	\$54.89 5GB 512Kbit/s	\$59.90 50GB 512Kbit/s	\$79.90 15GB 1.5Mbit/s	✓	✓	\$95 6mths	✓
Jump Internet ADSL	1300 785 867	http://jumpnet.com.au	\$30* 200MB 256Kbit/s	\$50* 2GB 512Kbit/s	\$80 40GB 512Kbit/s	N/A	✓	✗	\$0 12mths	✓
Koala ADSL	1300 720 109	www.koalatelecom.com.au	\$29.95† 5GB+ 256Kbit/s	\$34.95† 10GB+ 512Kbit/s	\$49.95† No limit 512Kbit/s	\$69.95† 15GB+ 1.5Mbit/s	✓	✓	\$129.95 6mths	✓
Lucidity Communications ADSL	1300 768 146	www.lucidity.net.au	N/A	\$59.95† 25GB 512Kbit/s	\$79.95† 35GB 1.5Mbit/s	\$79.95† 35GB 1.5Mbit/s	✓	✓	\$120 1mth	✓
Matilda Internet DSL	1300 665 865	www.matilda.net.au	\$29.95* 200MB 256Kbit/s	\$49.95* 1GB 512Kbit/s	\$59.95 10GB 512Kbit/s	\$89.95 10GB 1.5Mbit/s	✓	✓	\$110 1mth	✓
Midcoast Internet	1300 134 638	www.midcoast.com.au	\$28.50* 200MB^ 256Kbit/s	N/A	\$71.50* 10GB^ 512Kbit/s	\$98* 10GB^ 1.5Mbit/s	✓	✓	\$130 6mths	✓
Mydoor.com.au ADSL	1300 736 783	www.mydoor.com.au	\$34.95 500MB 256Kbit/s	\$44.95 1.5GB 512Kbit/s	\$79.95 30GB 512Kbit/s	\$89.95 15GB 1.5Mbit/s	✓	✓	\$110 6mths	✓
NCD ADSL	1300 768 433	www.ncd.net.au	\$29.95* 1GB 256Kbit/s	\$39.95* 2GB 512Kbit/s	\$74.95 35GB 1.5Mbit/s	\$69.95* 15GB 1.5Mbit/s	✓	✗	\$125 6mths	✓
Neighbourhood Cable	1300 366 248	www.ncable.net.au	\$27.95* 200MB 256Kbit/s	N/A	\$69.95 10GB 512Kbit/s	\$99.95 10GB 1.5Mbit/s	✓	✓	\$99 12mths	✓
Netbay Xtreme DSL	1300 733 215	www.netbay.com.au	\$29.95* 500MB 256Kbit/s	\$39.95* 1GB 512Kbit/s	\$49.95* 10GB 512Kbit/s	\$69.95* 10GB 1.5Mbit/s	✓	✓	\$99 12mths	✓
Netspace Home ADSL	13 14 56	www.netspace.net.au	\$29.95* 300MB 256Kbit/s	\$39.95 1GB+ 512Kbit/s	\$59.95 25GB+ 512Kbit/s	\$79.95 20GB+ 1.5Mbit/s	✓	✓	\$99 6mths	✓
Netspace SOHO ADSL	13 14 56	www.netspace.net.au	N/A	\$59.95 15GB 512Kbit/s	\$59.95 15GB 512Kbit/s	\$99.95 20GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
North Queensland Telecom ADSL	1300 664 178	www.nqtelecom.com.au	N/A	\$59.95 25GB 512Kbit/s	\$59.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$90 1mth	✓
OptraWeb ADSL	1300 785 954	www.optraweb.com.au	N/A	\$44.95 5GB 512Kbit/s	\$74.95 60GB 512Kbit/s	\$81.95 15GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
OptraWeb Excess DSL	1300 785 954	www.optraweb.com.au	\$32.95* 2GB 256Kbit/s	\$39.95* 2GB 512Kbit/s	\$74.95* 60GB 512Kbit/s	\$81.95* 15GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
OptraWeb Bundle DSL	1300 785 954	www.optraweb.com.au	\$27.95† 2GB 256Kbit/s	\$34.95† 2GB 512Kbit/s	\$69.95† 60GB 512Kbit/s	\$80.95† 15GB 1.5Mbit/s	✓	✓	\$129 6mths	✓
OzForces Residential ADSL	1300 134 081	www.ozforces.com	\$24.95* 200MB 256Kbit/s	N/A	\$68.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
OziSP ADSL	1300 654 653	www.ozisp.com.au	N/A	\$48.40 1.5GB 512Kbit/s	\$79.75 30GB 512Kbit/s	\$93.50 15GB 1.5Mbit/s	✓	\$2.75	\$132 6mths	✓
Ozlehost ADSL	1300 769 615	www.ozlehost.net.au	\$29.95* 200MB 256Kbit/s	\$59.95* 2GB 512Kbit/s	\$79.95* 20GB 512Kbit/s	N/A	✓	✓	\$120 6mths	✓
Pacific Internet DSL	13 36 35	www.pacific.net.au	\$29.95* 250MB 256Kbit/s	\$39.95 1GB 512Kbit/s	\$54.95 No limit 512Kbit/s	N/A	✓	✓	\$99 6mths	✓
Quik Internet ADSL	1800 000 355	www.gc.quik.com.au	\$29.99* 200MB 256Kbit/s	\$54.99 5GB 512Kbit/s	\$74.99 No limit 512Kbit/s	\$89.99 10GB 1.5Mbit/s	✓	✓	\$120 6mths	✓
Rabbit Internet ADSL	1800 501 106	http://rabbit.com.au	\$27.95† 200MB 256Kbit/s	\$34.90† 1GB 512Kbit/s	\$57† 30GB 512Kbit/s	\$71.41† 10GB 1.5Mbit/s	✓	✓	\$99 6mths	✓
Rapid Net ADSL	1300 724 677	www.rapidnet.com.au	\$29.95* 200MB 256Kbit/s	\$49.95 25GB 512Kbit/s	\$79.95 35GB 512Kbit/s	\$79.95 35GB 1.5Mbit/s	✓	✓	\$129 12mths	✓
REEDS.NET Internet Services	1300 734 445	www.reeds.net.au	\$29.95* 300MB 256Kbit/s	\$45 25GB 512Kbit/s	\$45 25GB 512Kbit/s	\$81.50 35GB 1.5Mbit/s	✓	✓	\$125 6mths	✓
Reset ADSL	1300 662 670	www.reset.net.au	N/A	\$59.95 25GB 512Kbit/s	\$59.95 25GB 512Kbit/s	\$99.95 35GB 1.5Mbit/s	✓	✓	\$109 12mths	✓
Schaelec TurboNET One	1300 554 687	www.schaelec.com.au	N/A	\$49.95 25GB 512Kbit/s	\$49.95 25GB 512Kbit/s	\$89.95 35GB 1.5Mbit/s	✓	✓	\$159 1mth	✓
Schaelec TeleNET Bundle	1300 554 687	www.schaelec.com.au	\$34.95† 15GB 256Kbit/s	\$44.95† 25GB 512Kbit/s	\$44.95† 25GB 512Kbit/s	\$82.95† 35GB 1.5Mbit/s	✓	✓	\$109 1mth	✓
Spin Internet	1300 303 375	www.spin.net.au	\$19.99* 200MB 256Kbit/s	\$39.99* 1GB+ 512Kbit/s	\$79.99 No limit 512Kbit/s	\$69.99* 15GB+ 1.5Mbit/s	✓	✓	\$99 6mths	✓
Supernerd SuperDSL	1300 888 090	www.supernerd.com.au	\$24.95* 500MB 256Kbit/s	\$44.95* 10GB 512Kbit/s	\$59.95 No limit 512Kbit/s	\$89.95* 30GB 1.5Mbit/s	✓	✓	\$110 6mths	✓
telaustalia SME & Res	1300 783 528	www.telaustalia.com.au	N/A	\$49.95 25GB 512Kbit/s	\$79.95 35GB 1.5Mbit/s	\$79.95 35GB 1.5Mbit/s	✓	✗	\$120 6mths	✓
Telstra BigPond ADSL	13 12 82	www.bigpond.com	\$29.95* 200MB^ 256Kbit/s	N/A	\$69.95† 10GB^ 512Kbit/s	\$99.95† 10GB^ 1.5Mbit/s	✓	\$2.50	\$99 12mths	✓
TSN Broadband	13 14 86	www.tsninternet.com.au	\$29.95 No limit 256Kbit/s	\$39.95 No limit 512Kbit/s	\$39.95 No limit 512Kbit/s	\$69.95 No limit 1.5Mbit/s	✓	✓	\$129 6mths	✓
Velocity Internet ADSL	1300 557 300	www.velocitynet.com.au	\$29.95* 300MB 256Kbit/s	\$49.50* 4GB 512Kbit/s	\$79.50* 50GB 512Kbit/s	\$89.50* 24GB 1.5Mbit/s	✓	✓	\$69 6mths	✓
VitalTel ADSL Broadband	1300 858 706	www.vitaltel.com.au	\$23.95* 200MB 256Kbit/s	\$48.95 10GB 512Kbit/s	\$48.95 10GB 512Kbit/s	\$68.95 10GB 1.5Mbit/s	✓	✓	\$139.95 6mths	✓
Web Ace ADSL	1800 202 012	www.webace.com.au	\$19.95† 200MB 256Kbit/s	\$39.95† 2GB 512Kbit/s	\$69.95 60GB 512Kbit/s	\$84.95 15GB 1.5Mbit/s	✓	✓	\$119 6mths	✓
Westnet Home ADSL	131 960	http://westnet.com.au	\$29.95† 500MB 256Kbit/s	\$34.95† 1GB 512Kbit/s	\$64.95† 25GB+ 512Kbit/s	\$69.95† 10GB+ 1.5Mbit/s	✓	\$0.83	\$99 6mths	✓
Wild IT DSL + Phone	1800 809 453	www.wildit.com.au	\$31.95† 15GB 256Kbit/s	\$39.95† 25GB 512Kbit/s	\$64.95† No limit 512Kbit/s	\$69.95† 35GB 1.5Mbit/s	✓	✓	\$109 1mth	✓
Wild IT Budget DSL + Phone	1800 809 453	www.wildit.com.au	\$28.95† 5GB 256Kbit/s	\$34.95† 10GB 512Kbit/s	\$64.95† 20GB 1.5Mbit/s	\$64.95† 20GB 1.5Mbit/s	✓	✓	\$99 1mth	✓
Yak Networks ADSL	1300 784 866	www.yak.com.au	N/A	\$54.95 25GB 512Kbit/s	\$54.95 25GB 512Kbit/s	\$87.95 35GB 1.5Mbit/s	✓	✓	\$119 1mth	✓
yourhub ADSL	1300 762 568	www.yourhub.com.au	N/A	\$55 1.5GB 512Kbit/s	\$80 15GB 512Kbit/s	\$95 10GB 1.5Mbit/s	✓	\$1	\$110 12mths	✓

Key: * ISP charges excess usage fees when you exceed your download limit. † This price only available if bundled with long distance telephony from the ISP. ‡ Additional download allowance available with this plan for use in off-peak periods; ^ ISP combines sent and received data when calculating usage; # Minimum BigPond Cable setup fee is based on 12-month contract with modem included. Telstra does not offer a BYO modem option.



OS challenge

with Ashton Mills

NEW SERIES!

Living in a Linux-only universe

Can Linux and open source really replace Windows? Ashton Mills says it can. We set him a challenge to avoid the impending Vista juggernaut, can he do it?

THE RATINGS

In this project we're making the assumption that Windows does all that we need, and we're seeing if Linux and open source software measures up. Perhaps that's not an entirely fair place to sit, as there will be tasks open source software can do better. However, as the de facto in operating systems for which everyone is familiar, it's our best basis for comparison. Oh geez, enough of the waffle, here's how we'll rate the experience of going Windows-free:

OPTIMAL – Passes with flying colours. The task could not only be completed, but is better or easier than under Windows.



PASS – No problems. The task can be completed exactly as under Windows.



IFFY – When a task could only be partially completed, or completed but not without issue.



FLOP – Not possible to complete at all. (Probably not a good thing.)



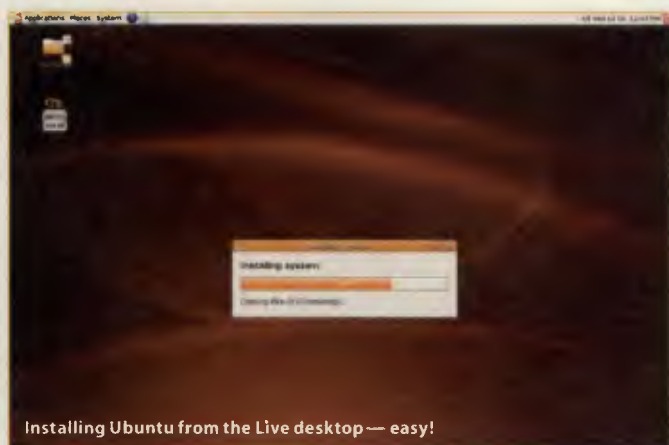
When I was first given this task I had to sit and blink a few times — if for nothing else than dramatic pause. I'm a self-confessed Linux nut, but even I'm cautious to do away with Windows completely. There's a reason I have a dual-boot Windows and Linux machine. Several of them, in fact.

But have I just been conditioned into using Windows because of past experience? Or for applications or file formats? (Or the myriad other reasons that make Windows a comfort zone through familiarity?)

Not unsurprisingly, Linux, and open source software in general, has always had an image problem. It doesn't help that its inception by an uber nerd and its subsequent adoption by bearded geeks the world over didn't lend it a certifiable authenticity. It grew in darkened server rooms, with the toffs on floors above using their Windows "desktops" none the wiser.

But slowly, surely, its popularity grew outside of the elite clique, and the development of fully featured desktop environments pushed Linux into a wider world view. Ostensibly, this was so system administrators could work more efficiently while having a *Matrix* screen saver running behind their terminal (you know who you are). But in turn it opened Linux up to a whole new world of users — people like me and you.

That was many years ago, now. The Linux desktop has progressed so far as to provide a challenge to Microsoft. No, not to its dominance, but to its pride. Arguably, there are



Installing Ubuntu from the Live desktop — easy!

simply some tasks a Linux desktop does better. Could it be that Microsoft might have something to learn from the open source upstart? Vista certainly bears the fruits of both new initiative and features we now see in both Linux and Mac OS X.

But, I'm a realist. I actually don't care as long as the OS I use is easy, intuitive, and does *what I want to do when I want to do it*. This is the purpose of a desktop OS; the yard stick by which we'll measure our journey into a Windows-free world.

I'll be taking the new user perspective, seeing how our open source operating system and applications hold up for all the everyday tasks it needs to do, work and play — be it browsing, banking, printing, playing, watching DVDs, sharing files, talking on VoIP, editing images, gaming, linking to digital cameras, backing up the system and more. But I'll also be

going under the hood where necessary to explain what's different and why.

Can you really only use open source software — with no fiddling and futzing around — to do *everything* you've become used to doing under Windows?

This is exactly what we're going to find out. Cold turkey-style.

LINUX IS LIKE ICE CREAM

But not a box of chocolates. Well, unless you bring *virtualisation* into it. Anyway, if operating systems were ice cream, Windows would be vanilla, and it'd come in different serves such as cones, cups and bath tubs full of the stuff. Linux, as you know, isn't quite like that — you sort of have to bring your own containers. Some people even build their own. But it does come in a hundred flavours to suit almost every taste. The flavour for our foray will be Ubuntu 6.06 LTS

Ubuntu's extensive software catalogue: applications that are ticked are already installed.

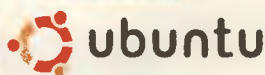


Nelson says "hi" in Ubuntu's Experience video — part of the Live desktop.



Ubuntu - Linux for Human Beings!

1. [Learn about Ubuntu](#)
2. [Participate in Ubuntu](#)
3. [Get help with Ubuntu](#)



Thank you for your interest in Ubuntu 6.06 LTS - the *Dapper Drake* - released in June 2006.

Ubuntu is an entirely open source operating system built around the *Linux* kernel. The Ubuntu community is built around the ideals enshrined in the *Ubuntu Philosophy*: that software should be available free of charge, that software tools should be usable by people in their local language and despite any disabilities, and that people should have the freedom to customise and alter their software in whatever way they see fit. For those reasons:

- Ubuntu will always be free of charge, and there is no extra fee for the "enterprise edition," we make our very best work available to everyone on the same Free terms.
- Ubuntu includes the very best in translations and accessibility infrastructure that the free software community has to offer, to make Ubuntu usable for as many people as possible.
- Ubuntu is released regularly and predictably: a new release is made every six months. You can use the current stable release or the current development release. Each release is supported for at least 18 months.
- Ubuntu is entirely committed to the principles of open source software development: we encourage people to use open source software, improve it and pass it on.

Find out more at [the Ubuntu website](#).

All about Ubuntu.

(Long Term Support), a Debian-based distribution and the very version recently bundled with APC (August DVD). For the purposes of imagery, let's call this flavour chocolate, because chocolate is nice. If you don't like chocolate, it can be strawberry (I don't mind).

Chocolate is a popular, amiable flavour, and Ubuntu is no different. It's built a reputation as the easiest and most desktop-focused distribution available, and so is a good choice for this adventure.

Keeping in mind that as Vista will be a DVD release, we'll be installing the DVD version as well, weighing in at just over 3GB. As 64-bit processors are the de-facto now and Vista will be 64-bit native preferred, we'll also be going with the 64-bit edition of Ubuntu, running on an Athlon 64 4400+ with 2GB of memory.

As far as installation goes, it's as simple as specifying a username, time zone and target partition (and doesn't bear a rating). Especially as there's no direct comparison with Windows, which for many comes pre-installed.



FIRST IMPRESSIONS

So knowing this will be my system henceforth, what's the first impression of my new

Linux-only home? Installation and hardware detection was a breeze. Ubuntu found and setup the onboard Nvidia NIC with DHCP, which works fine for my network. It also correctly installed the official binary drivers for Nvidia for the installed 7900GTX.

Oddly, the Live DVD detected both of my 19in LCD monitors and ran them cloned during the install, but my new installation is only using a single monitor. A quick look around at the display options shows there's nothing at all for setting up dual-monitors — though, to be fair, this is a feature lacking from all Linux distributions and desktops and not just Ubuntu. Linux is fully capable of utilising

multiple monitors thanks to the X Window system's *Xinerama* extensions and Nvidia's own TwinView features for Nvidia cards, but it requires editing the display configuration files by hand, which comes under the "futzing around" heading and really shouldn't be necessary.

On this point, Windows is far ahead. Even though a tool like UltraMon is essential to make the most of multiple monitors under Windows, at least the option and basic setup to use multiple displays

is there out of the box.

This aside, Ubuntu's desktop is very slick and clean thanks to its use of Gnome, a more minimalist desktop environment compared to the feature-filled (sometimes overly so) KDE. Its top and bottom panels don't appear to take any more screen real estate than the Taskbar under Windows, but display more information.

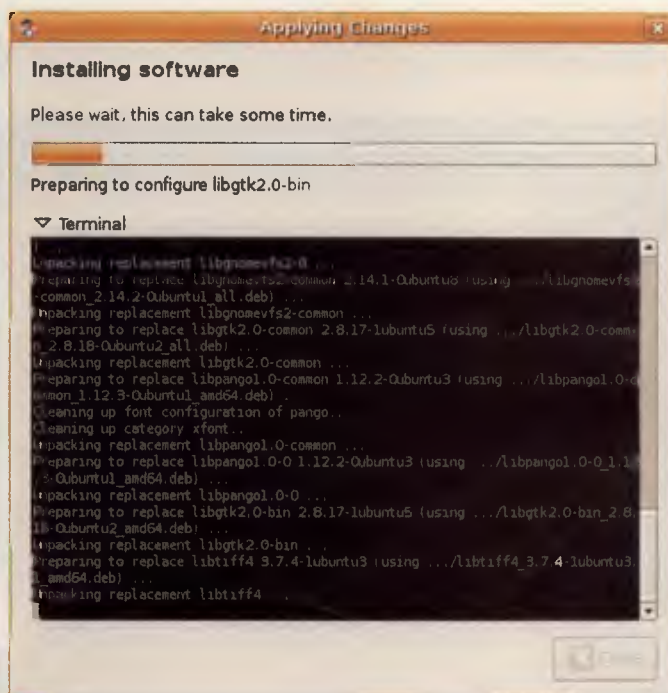
Overall, as first impressions go (and of familiarity with a desktop paradigm), it's a happy little home so far — just as you'd expect.



HAVE I JUST BEEN CONDITIONED INTO USING WINDOWS BECAUSE OF PAST EXPERIENCE? OR BECAUSE OF APPLICATIONS OR FILE FORMATS?



Just a few updates to install...



Ubuntu's Update Manager bears a striking resemblance to the same app under Windows.

...and seeing what goes on under the hood.



BEING UP TO DATE

And now — let's move onto the fun stuff! Under Windows, I'd have to say I'm a bit of a habitual software upgrader (and can't help wanting the latest software updates for pretty much all my installed software, whether it's a critical security fix or just a mild feature addition that I'll probably never even use).

So, the first task to put to test on this open source system is to upgrade to the latest recommended updates.

For this purpose, Ubuntu has an excellent tool — no doubt inspired by Windows Update and driven by Debian's repository system.

Running in the task bar is a neat little update manager that checks for updates once a day and prompts to install them if necessary. Selecting "Update Manager" from System / Administration starts the process immediately, and not surprisingly the tool found a few updates for Ubuntu 6.06. (And, by "a few", I suppose that I should clarify that I really mean 127

updates — all in all amounting to about 186MB).

Keep in mind this represents not just security fixes, but updates to core operating system components as well, which in this case included a new version of the Gnome desktop (2.14.2 specifically) and of the OpenOffice suite as well.

Which leads us to an advantage one simply can't fault for the open source solution — regardless of how this experiment eventually comes to fare, I have an operating system, a full office suite and more, for nothing more than the cost of the

August issue of APC and its cover DVD (or, lacking this, the bandwidth to download it!). It's a positive Windows will never be able to bear.

So, although the updates are large and many, my entire system is now updated to the latest Ubuntu release, including new (and hopefully better) versions of the software installed.

We've only just begun in these three pages, but we're off to a good start with our flavour of ice cream. Next month we'll look at web browsing, security, formats, media, DVDs and entertainment! [CONTINUE](#)

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**FIRST
LOOK**

SATA goes external

Hard drive cables are now reaching beyond the box — in an attempt to kill USB.
John Gillooly explains how eSATA works.

Over 10 years ago, the PC industry began work on a new peripheral connection standard. Dubbed Universal Serial Bus (USB), it aimed to replace the serial and parallel ports with a unified peripheral connection standard, complete with true plug and play functionality.

After suffering an ignoble birth in the early days, USB has matured into the simple plug and play connection originally envisaged.

USB has enabled a variety of new product categories, one of the most important of which is external storage. From USB keys to external RAID arrays, USB, and to a

lesser extent FireWire, have become the standard means of connecting external drives.

From a simplicity standpoint, this is just super, but it is a less than ideal means of connecting a hard drive. For example, requesting data from the USB drive involves converting the ATA signal to USB at the PC end, transporting it and converting back into ATA, with the same conversion needed to send data back. This slows down transfers, and is especially harsh for transferring burst data. Modern hard drives use extensive caching to speed up burst transfer, but this high-speed flash memory is negated by the need to convert data to USB.

If external hard drives were just used to shuffle a few documents backwards and forwards this wouldn't be too much of an issue, but modern external drives are designed to hold large repositories of data — with models holding half a terabyte or more not uncommon.

In contrast, a drive connected internally by Serial ATA has at least 1.5Gbit/s of available bandwidth and can deliver burst data at close to three times USB speed. In fact, some early SATA-supporting motherboards from Gigabyte shipped with a SATA pass-through bracket to let people attach SATA drives without opening their PC or needing a USB enclosure. The downside is that it violated a lot of the SATA spec and exposed just how fragile the SATA connector could be.

SOLVING USB'S ISSUES

With this in mind, the SATA-IO working group sat down a few

years ago and began plans to officially extend SATA beyond the confines of the PC case. What has resulted is external Serial ATA (eSATA), adapting SATA 3Gbit/s to work with external drives.

Key to this is a new connector, designed to cope with both the increased chance of electrostatic discharge and connector damage. SATA-IO quotes the lifespan of a normal internal connector as around 50 insertions, while the new eSATA connector is designed for 5,000 odd insertions.

This connector is physically different to internal ones, preventing confusion between eSATA and SATA cabling. eSATA cables are also designed to operate over distances up to 2m, while SATA has a 1m limit.

Unlike USB, the eSATA cable is not powered, which means drives will need their own power supplies. While this alone will keep the market for USB hard drives healthy, especially for notebook users, it also facilitates a wider range of uses for eSATA than just a single external drive.

eSATA devices plug into a port on the rear of a PC. So far, we have seen two implementations in the APC Labs. Some boards have an eSATA port located on the I/O backplane, usually as a single port underneath the parallel port. This is connected via motherboard tracers to the SATA controller. Others ship motherboards with a bracket designed to sit over a PCI slot. This bracket is plugged via a cable into a SATA connection on the motherboard.

It is this direct connection from the SATA controller on the motherboard to the external device that allows eSATA to shine. It means that — to the operating system — an eSATA drive is functionally identical to an internal SATA drive. Because of this



▲ The eSATA plug (left) is physically different from the internal SATA (right).



Some enclosures also have USB support. However, eSATA will be the fastest option.

relationship, traffic from the eSATA drive operates at the same speed as internal drives.

Finding a motherboard that supports eSATA still requires some shopping around — there aren't many that integrate support, although this will change over time. If you don't have a motherboard that supports eSATA, there are PCI controller cards already available (some drives even ship with one).

PLUGGING IN

There are a variety of products being touted for eSATA. At the most basic level are single external hard drives. For manufacturers, these are easier to make than USB ones, as the native eSATA connection gets rid of the need for electronics to convert the signal from SATA to USB and back again. All the electronics the manufacturer needs to pack in are the power supply and cooling for the drive.

However, this external drive concept can be taken one step further now, as eSATA allows two external hard drives to be arranged in a RAID array — something unthinkable with USB. APC has even seen prototype external RAID array boxes that use a single eSATA cable to connect to a PC (such devices are beyond the scope of USB and tend to end up being marketed as SAN/NAS devices with an Ethernet interface).

The good thing is that Computex this year demonstrated that numerous drive and enclosure manufacturers will be jumping on the eSATA bandwagon in the coming months.

It's also important to note that the potential of eSATA does not stop with the PC. Like most PC-centric technology nowadays, new avenues are being found in the home entertainment realm.

One potential use suggested by the SATA-IO is for eSATA-equipped set-top boxes and DVRs. This would allow quick and easy backing up of saved data to external drives without the DVR needing USB support.

One realm where we don't expect to see eSATA appearing for some time is in external optical storage. The woeful uptake rate of SATA — among optical drive manufacturers — is well-documented. The lower-spin speed and data transfer rates of optical storage don't come close to touching the transfer speeds of Parallel ATA/100 cables. This has left us with a situation where there is only one manufacturer of SATA optical drives on the market.

This also means that USB is still sufficient for connecting external optical drives. Benefits such as

This external bracket is one way of adding eSATA to your PC.

burst data transfer rates and reduced overheads aren't an issue with CD/DVD and first-generation Blu-ray/HD-DVD drives, and this situation is unlikely to change in the near future.

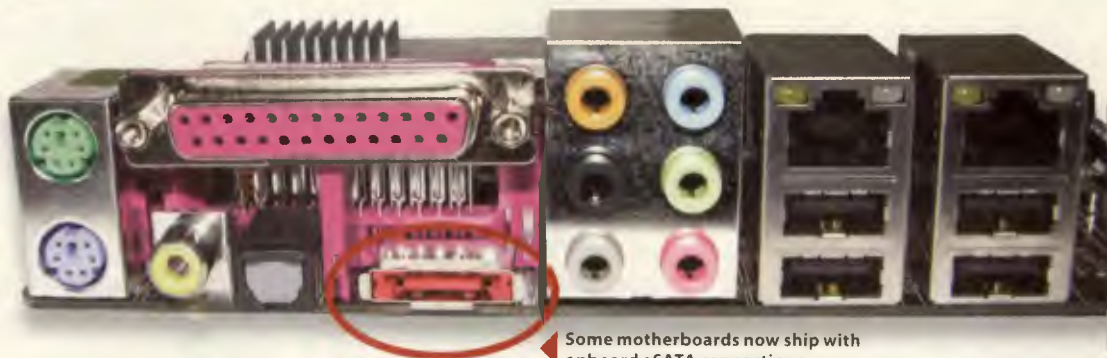
SIMPLICITY IS KING

While there are definitely areas in which USB or FireWire-based external storage will continue to dominate, others are much more tailored to eSATA. By reducing the performance overhead of converting to USB, eSATA can maximise the bandwidth of external hard drives. This means faster and smoother file transfers and, because the eSATA drive is connected natively, it can be used just like an internal drive, not

purely as an external file dump. eSATA is here to stay, and those looking into external storage options will do well to consider it, especially if speed is of concern. Quite simply, there is no faster way to connect an external hard drive to your PC. **TOPIC**



ESATA ALLOWS TWO EXTERNAL HARD DRIVES TO BE ARRANGED IN A RAID ARRAY — SOMETHING UNTHINKABLE WITH USB

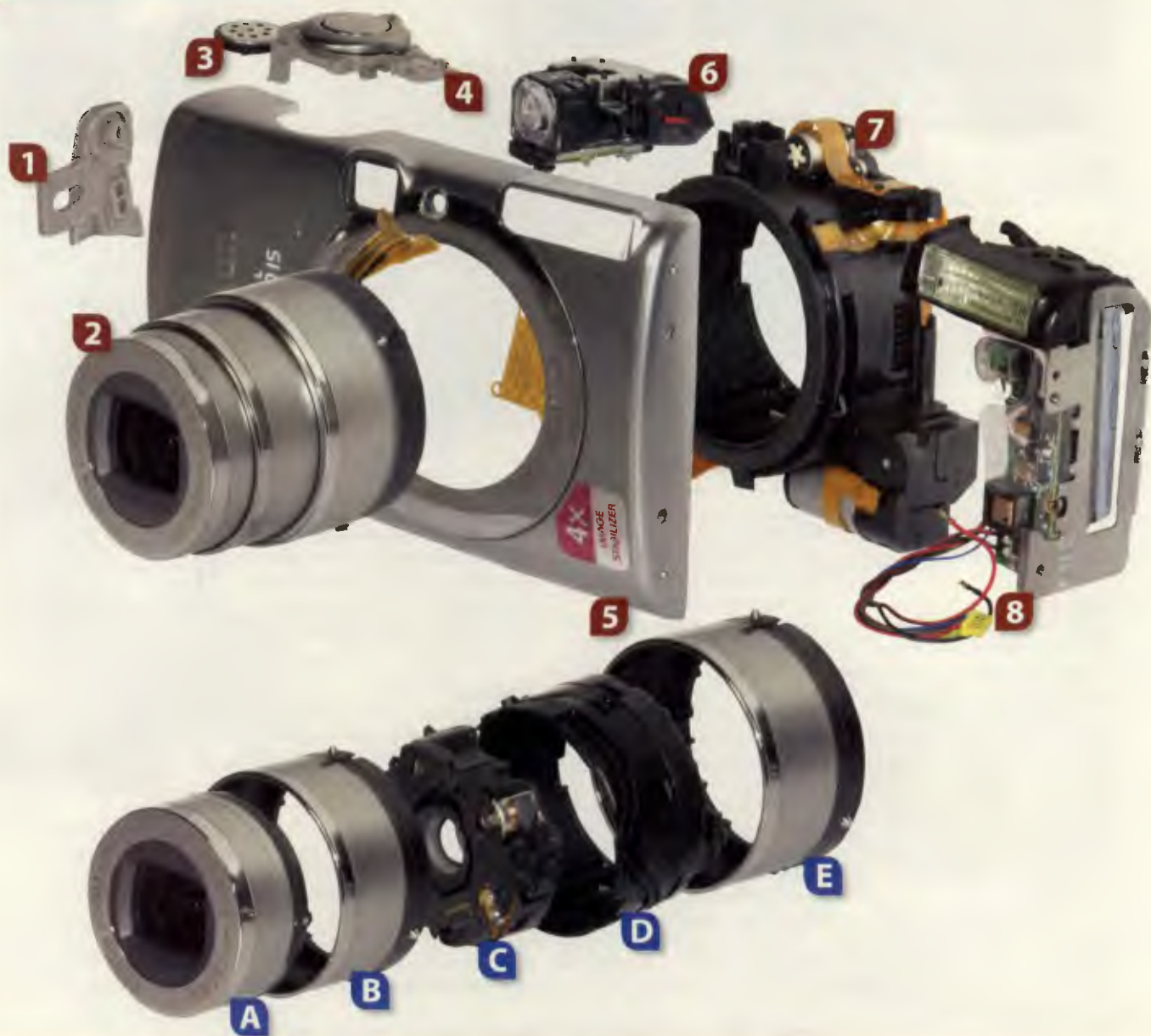


Some motherboards now ship with onboard eSATA connections.



ape

exploding tech

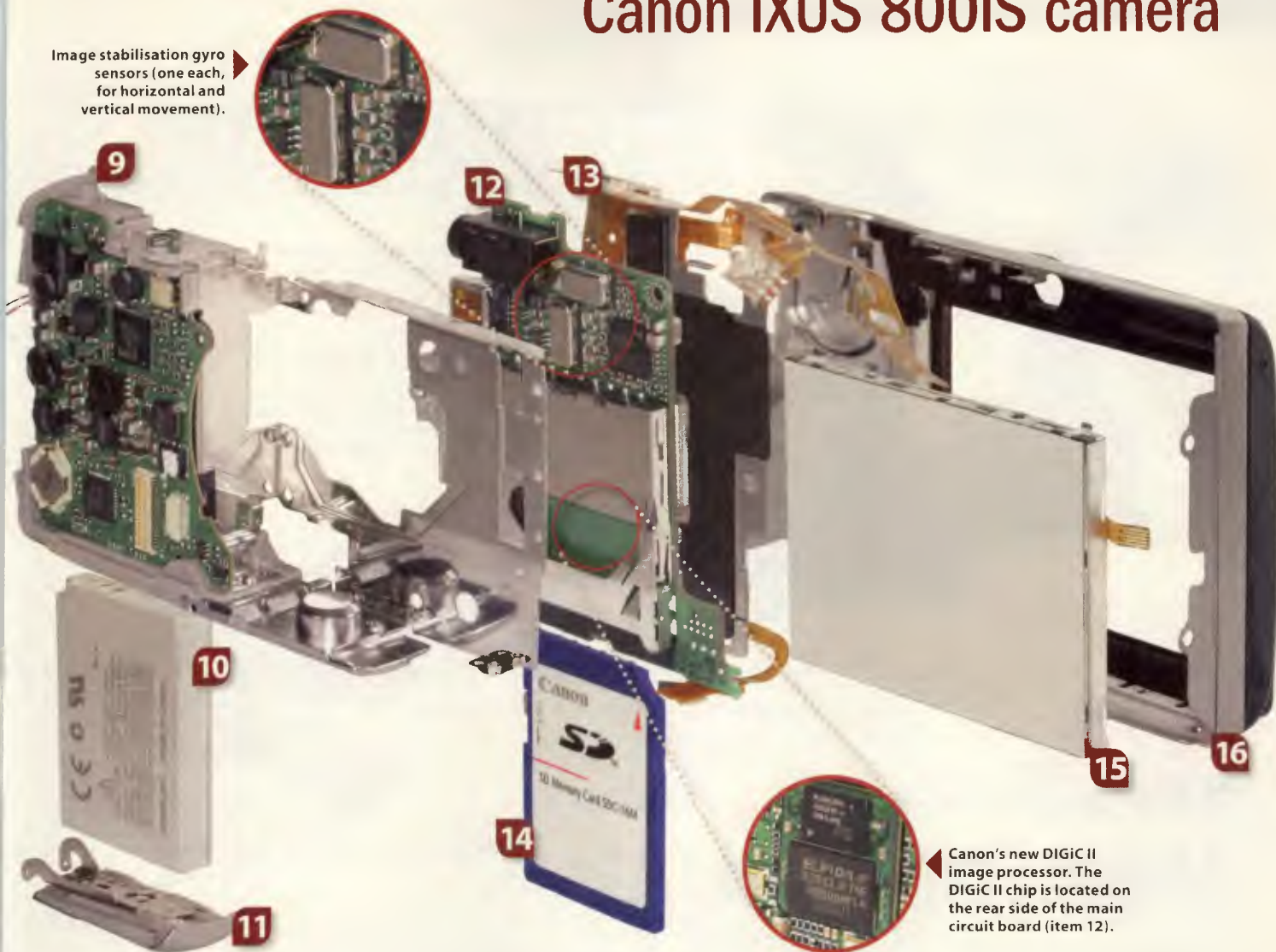


We explode the Canon IXUS 800IS, a compact camera with image stabilisation.

- | | | |
|---|---|--|
| 1 Jack cover for USB and AV terminals | 8 Flash unit | 13 Flexible circuit with operation buttons |
| 2 Lens unit | 9 Camera chassis with power supply module | 14 SD memory card |
| 3 Speaker for movie playback with sound | 10 Lithium-ion battery pack | 15 LCD unit |
| 4 Shutter button | 11 Battery cover | 16 Back cover |
| 5 Front cover | 12 Main circuit board with SD card slot (DiGiC II image processor is mounted on the back, lower circle) | |
| 6 Optical viewfinder | | |
| 7 Lens drive mechanism | | |

Canon IXUS 800IS camera

Image stabilisation gyro sensors (one each, for horizontal and vertical movement).



Inside the zoom lens assembly:

- A** Front lens barrel with UA lens
- B** Second lens barrel
- C** Optical image stabiliser unit and shutter unit
- D** Lens cam barrel
- E** Outer lens barrel





e-commerce

fundamentals of a shopping cart system



Shopping cart options

Thousands of Australian businesses are now selling goods and services online to an ever-growing customer base. In this new series, APC will show you how to create an online business. We'll assume you want to be an internet merchant.

In this first part, we look at how a basic e-commerce setup works and the main shopping cart options.

In future issues, we'll explore the carts in detail and look at some specific examples of businesses selling online.

THE CHOICES

Once you decide to become an internet merchant, you need a shopping cart package — the software/services that display your products and prices, keep track of a customer's selections, add up the cost at checkout, authorise the transaction, deposit the money in your account and send you the order for fulfilment. There are countless variations, ranging from very simple carts that are basically just HTML-based order forms, to carts with real-time credit card processing which import your business' product databases directly into the cart and export the orders for use with your accounting system.

The simplest way to differentiate between the main shopping cart options is how they generate the product catalogue pages and do the payment transactions, as this tends to relate directly to their sophistication and cost. The following e-commerce options are the most common in order of simplest to most complex:

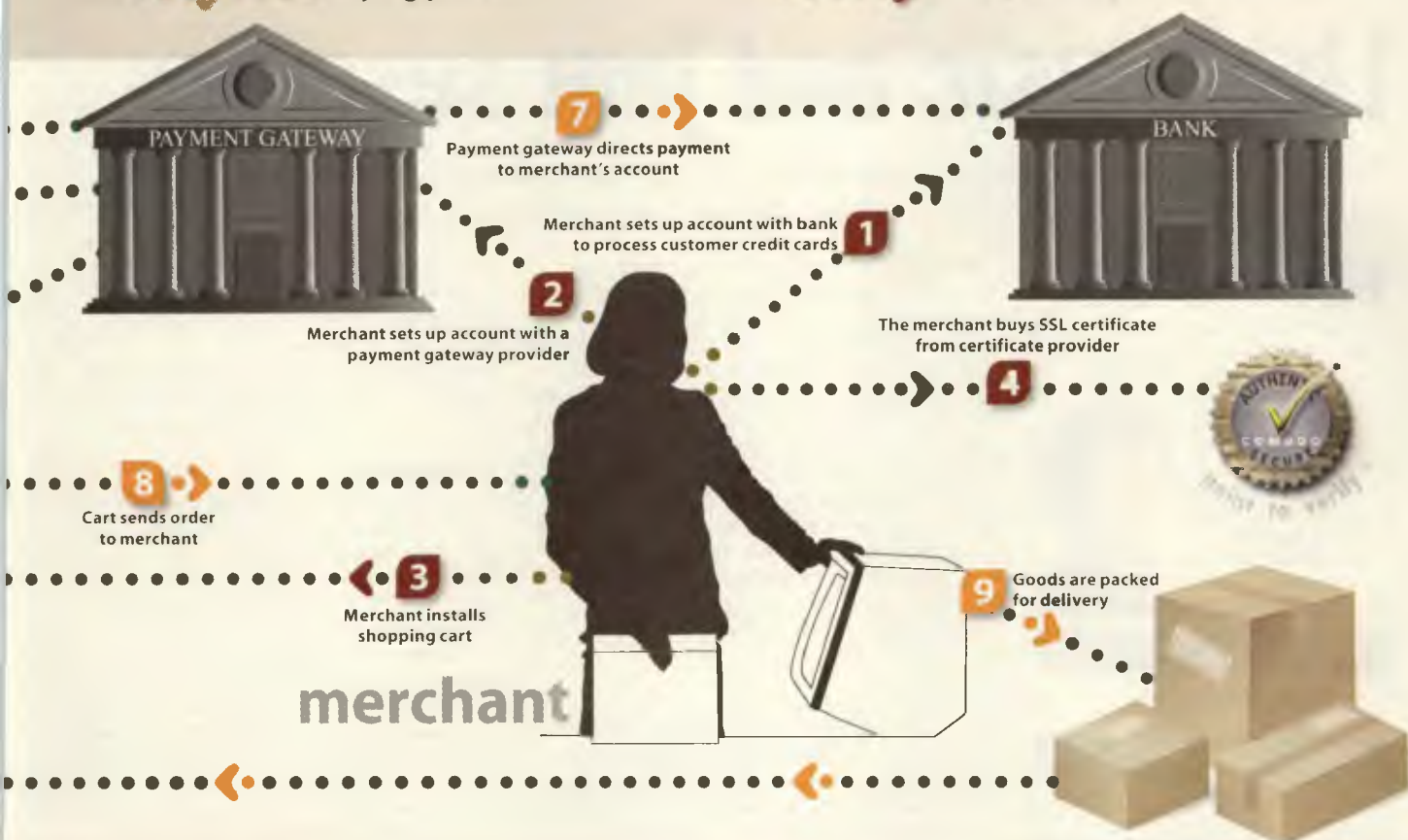
1. Product pages with "Buy Now" buttons linked to third party credit card payment providers
These aren't strictly carts, but simple pages on the merchant's own web site, generated by the merchant using any HTML-coding software. Descriptions of products and prices are added

manually, as well as a "Buy Now" button, which activates a script that transfers the customer to a third party credit card payment provider like PayPal. If you're selling just a few products this is the simplest, most hassle-free way of doing e-commerce. The downside is that you have to stitch everything together yourself, making it virtually impossible to manage once you have more than a few products.

2. Shopping carts with product catalogues hosted on the merchant site and checkout and payment services hosted on a third party site
If you're selling more than a few dozen products, you need a tool that automatically generates your product and category pages and this is where shopping cart software comes into its own. Carts can be purchased off the shelf for a once-off fee and will generate product catalogues to be hosted on your web site. However, in this option, the cart provider will host and manage the checkout and payment services. Ezimerchant shopping carts are an example of this. Once customers have filled the cart they are linked out to a secure page on the Ezimerchant site which processes the payment. There is a monthly fee for the hosted payment services in addition to the once-off payment for

Buying process

Setting up the store



the cart software. You will need to set up an Internet Merchant account with your bank in order to be able to receive credit card payments from customers.

3. Shopping carts with product pages and checkout hosted on the merchant web site, linked directly to the payment gateway

The cart's product and checkout pages are hosted on the merchant's site and the cart links directly to a payment gateway. In this option, you'll need an account with a gateway supported by the cart. The gateway is the middleman that verifies the customer's credit card funds and directs them into your internet merchant account. You'll also need to purchase an SSL (Secure Sockets Layer) certificate to establish secure connections to shoppers' computers. This kind of fully hosted cart generally requires access to coding expertise so that it can be integrated into the merchant's site and linked to specific gateways. An example is an open source cart from osCommerce.com, which is available for free download on the web. However, you'll need to be conversant with PHP scripting and MySQL databases to set it up and maintain it on your web server.

4. Fully hosted e-commerce shop front

The entire shopping cart and payments system are fully integrated and hosted by the third party Application Service Provider (or ASP). A fully hosted shop front can make up your entire site, or just the shopping pages, which are customised to carry your business's unique branding. The fully hosted solution is recommended when a merchant wants to focus on the business of selling and leave the technology infrastructure to be set up and maintained by someone else. For merchants who are selling a large range of products with complex business rules, this is probably the only realistic option unless they are prepared to hire programmers to maintain the sophisticated cart technology and transactional systems required.

NetMerchant provides one example of an Australian company which provides fully hosted e-commerce shop fronts. Its hosted cart can be integrated into a web site so that the user doesn't even notice the difference, such as the shop area on the Subaru.com.au site. Or, it can be an entire web site such as www.piano.com.au — basically one giant shopping cart. Because a company like NetMerchant has its own team of programmers, it's able to create shopping carts

tailored to closely suit the business rules of the merchant.

5. Fully hosted e-commerce solution with deep links to inventory and ordering systems

An option for mid-size to large businesses that outsource not just the e-commerce functions but most of their major business applications. The advantage is that the cart, order management, real-time inventory and customer management are completely integrated, as they're hosted in the one database with the one provider. The NetSuite Small Business product is an example of this.

6. Enterprise e-commerce

At the very top end of online selling, enterprises create their own e-commerce infrastructures that are integrated deeply into their other business systems. This approach requires multi-million dollar investments — and is outside the scope of this series. 

NEXT MONTH

Next time, we'll look at what's involved in setting up a basic shopping cart.

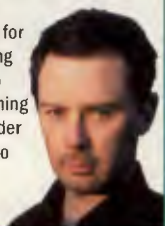


Live music and jam sessions

In this month's audio Workshop, *Daniel Winter* takes an ordinary network of PCs and turns them into a cluster of synchronised synthesisers, samplers and live music sequencers.

DANIEL WINTER

Daniel Winter is a freelance developer with a background in multimedia and audiovisual production. He has been developing interactive database applications for a decade and producing music and video for 15 years. With award-winning online applications under his belt, Daniel has also been writing for APC since 1999.



SKILL LEVEL

Beginner to intermediate

TIME TO COMPLETE

Two hours

REQUIREMENTS

AudioMulch; networked jam participants.

INSIDE INFO

AudioMulch
www.AudioMulch.com
 MDA VST plug-ins
www.mda-vst.com

In this Workshop, we'll use a program called AudioMulch, the brainchild of Australian programmer and musician Ross Bencina. It is a real-time music composition tool that can be used to create live music on any Windows PC with a sound card. It also supports MIDI and network synchronisation, so that multiple computers can be used together to create a tightly integrated performance.

After many years of development, AudioMulch finally made it into full release last year and the latest evaluation trial version is available from www.AudioMulch.com. AudioMulch costs US\$89 to buy — but for that you get 60 days of unlimited use with the trial version.

CONFIGURATION

After running the AudioMulch installer, fire up the main application and head straight to the settings window using the F4 key. In the Audio General section, ensure that 44.1kHz is selected as the sample rate before moving on to the Audio Driver section.

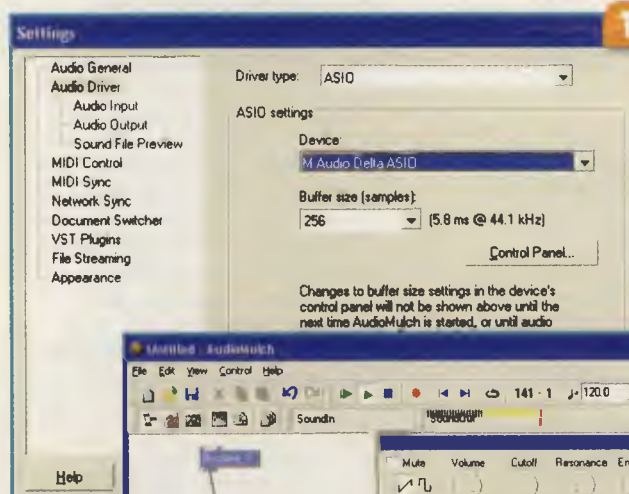
If it is available, select ASIO from the driver type menu, as this will provide access to high-performance real-time audio drivers for your hardware. After doing this, check the Audio Output settings to see if an output device is still enabled. If no device is available under the ASIO drivers, switch back to the default driver type.

SYNCHRONISATION

To jam with other musicians using electronic instruments, it's important to synchronise everyone's PCs so that the music is kept in time. This involves having one device generate a "sync clock" — and then every other device on the network chasing it.

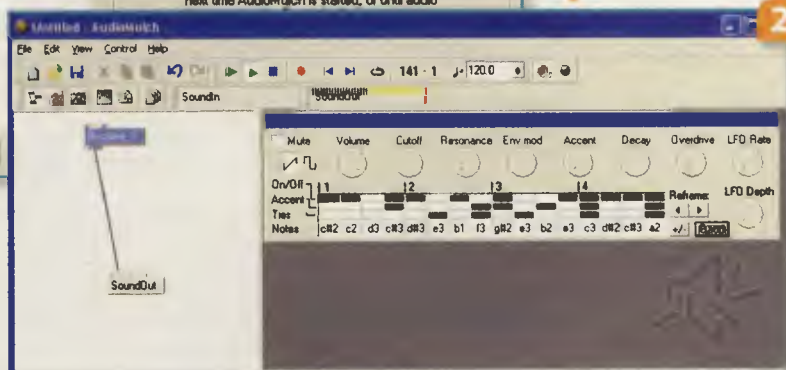
Note: the fastest computer or a dedicated hardware device (such as a drum machine) is recommended for generating the clock.

First, ensure that everyone's PC is connected either by Ethernet, wireless or FireWire. Then go to the Network Sync options in the settings window. Everyone must use the same port number and the person generating sync can enter a network subnet to send to. For example,



ASIO drivers ensure very fast response times for supported audio hardware — and should be enabled if available.

A simple AudioMulch setup with a Bassline module connected to the SoundOut module.



A complete bass and drum loop using a virtual bassline synthesiser and a handful of WAV file samples.

if there were six computers with IP addresses 192.168.1.1 through to 192.168.1.6, the sync-generating PC would send to 192.168.1.255.

Finally, select either Generate Network Sync or Chase Network Sync from the control menu. Once everyone is configured, the sync generator can start playback and all the other PCs will lock into its tempo.

As an alternative, you can use AudioMulch's MIDI sync option. MIDI is the best option if everyone in the network has MIDI connectors; otherwise IP networking is the only way.

GENERATORS

Now that you've got AudioMulch configured and have an understanding of network synchronisation, it's time to explore the AudioMulch interface to generate sounds.

The AudioMulch window is split into three main areas. On the left-hand side is the patcher panel, used to connect audio sources and effects together into a signal chain. This includes a SoundOut module for supplying the sound card with audio.

The right-hand side is used to display control panels for any or all of the modules in the patcher window. These control panels usually include a volume knob or slider, as well as several other settings relevant to the instrument, effect or synthesiser being controlled.

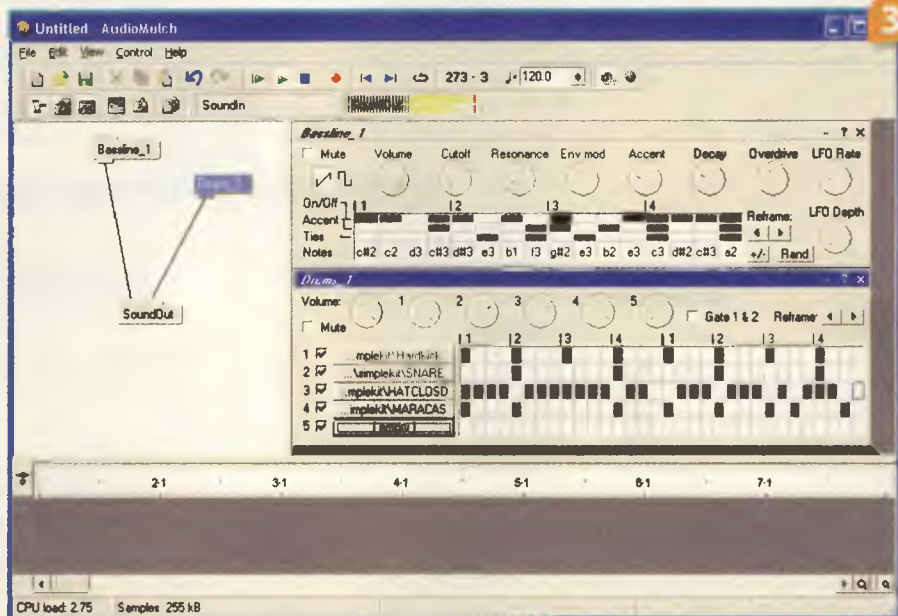
Along the bottom of the AudioMulch interface is the automation pane which is used to construct a timeline for the composition. To get a feel for the relationship between the patcher/properties windows, try the following:

1. Right-click in the white patcher window and select New > Signal Generators > Bassline.
2. Click and drag the tab on the bottom of the Bassline_1 module onto the top left tab of the SoundOut module.
3. Double-click the Bassline_1 module to open its properties window.
4. Click the play button in the toolbar.

CONNECTING THE AUDIO

To hear everyone's output, run the sound of all the PCs through one or more sets of amplified speakers. The cheapest way is to run the output of each computer into the input of the next one, using AudioMulch input modules to funnel the audio. The PC at the end of the chain then connects directly to the speakers.

Another alternative is to use a mini audio mixer; these can be picked up for under \$100 from



SELECT ASIO FROM THE DRIVER TYPE MENU: THIS PROVIDES ACCESS TO HIGH-PERFORMANCE REAL-TIME AUDIO DRIVERS

5. Click and drag the Volume knob in the Bassline_1 properties window until the sound can be heard.
6. Click the button marked Rand in the Bassline_1 properties window.
7. At this stage, the AudioMulch window should look similar to that shown here. The output level indicators in the toolbar should be coloured and an electronic bass melody should be playing from the speakers and/or headphones.

ADDING A DRUM MACHINE

To further this retro analog sound, add a drum machine to the mix. Right-click the patcher window and select New > Signal Generators > Drums. This Drums generator now also needs to be connected to SoundOut.

Drag the output tab of the new Drums_1 module onto the top-right tab of the SoundOut module. Then double-click the module to open the properties panel.

In the lower left-hand corner are five buttons labelled "empty". Click the top one and browse for Hardkick.wav in the AudioMulch\samples\drums\simplekit folder. Next, click the boxes beneath the numbers 1, 2, 3, 4, 1, 2, 3, 4 in the grid.

Turning up the two left-most volume knobs in the Drums_1 panel will now reveal a bass drum beat in the mix. Add a few more WAV files and a complete bass and drum loop, like that in [image], can be composed in a matter of moments.

ADDING A MIXER

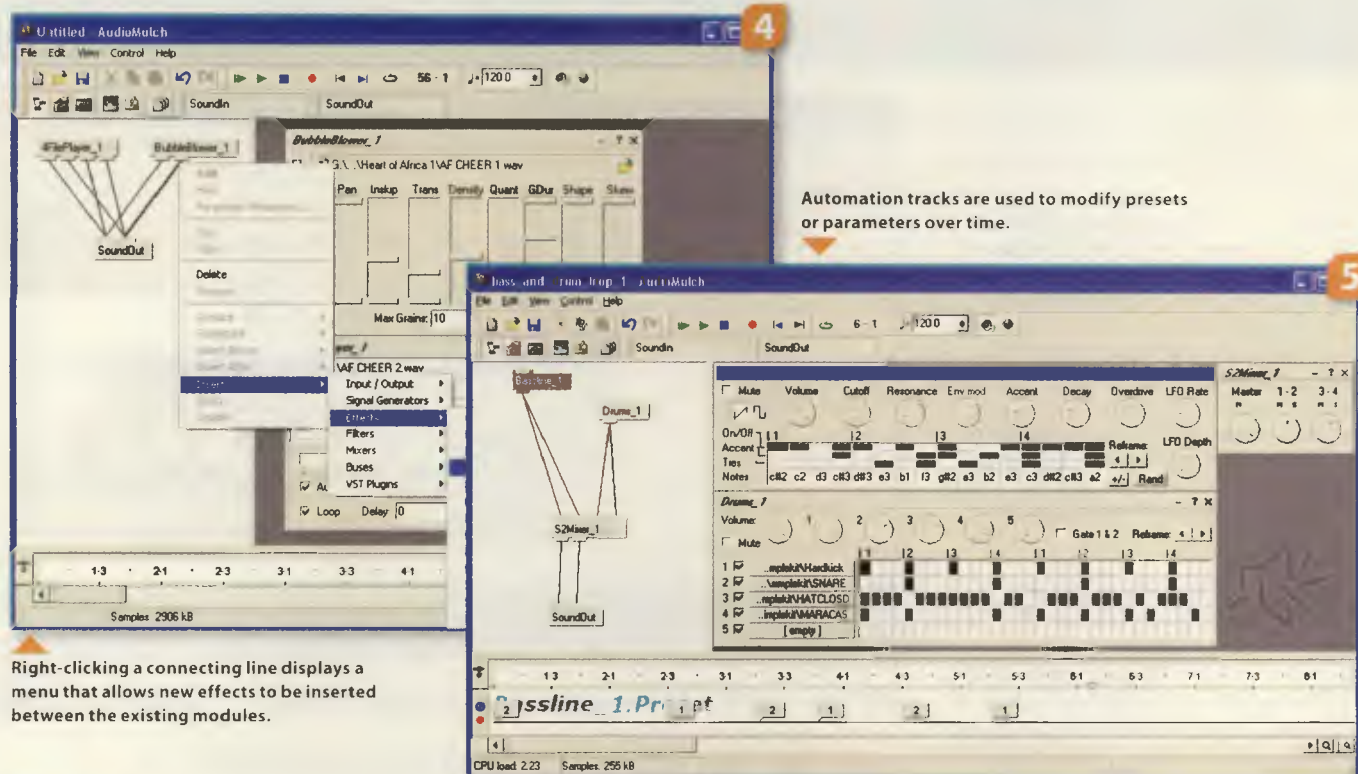
The two tabs at the top of the SoundOut module correspond to the left and right stereo channels. Consequently, the drums will be emanating out of one speaker (and the bass from the other), because of the way they have been connected.

To create a more natural sound, a mixer module can be added to combine the left and right signals of the two generators. To do this, add an S2Mixer from the right-click menu under Mixers. Click and delete each of the lines connecting the existing Bassline and Drums modules to the SoundOut module.

Next, create new connections between the output of the Bassline and the first two inputs of

electronics and music stores. Provided there are enough inputs on the mixer to handle all the PCs, this will get the best results.

A handful of mini-jack adapters will also do the job, each allowing two plugs to combine into one. You'll need one for each PC; these can be piggy-backed so that a single plug is left to connect to an amplifier. While it's not the audiophile's preferred choice, it will get your network jamming in no time!



Right-clicking a connecting line displays a menu that allows new effects to be inserted between the existing modules.

Automation tracks are used to modify presets or parameters over time.



TO HAVE YOUR CHANGES OCCUR AUTOMATICALLY, RECORD THEM IN THE AUTOMATION WINDOW

the new S2Mixer. Repeat this for the Drums, connecting them to inputs three and four.

Finally, connect the outputs of the S2Mixer to the SoundOut as shown in 5. Double-clicking the S2Mixer_1 module will reveal new knobs that control the output levels of the Bassline and Drums. Note also that each property window also contains a question mark icon that can be clicked (to bring up help for that module).

EFFECTS CHAINS AND PLUG-INS

To insert an effect or filter between any two modules, right-click on the line connecting them and select Insert from the menu. 6 demonstrates the insertion of a Flanger between a BubbleBlower and the SoundOut module.

PLUG-INS

AudioMulch also supports standard VST plug-ins. These are effects that work with a variety of audio programs such as Audacity, Audition, Cubase and FL Studio.

To use VST plug-ins in AudioMulch, the plug-in directory needs to be set in the configuration options. Once again, hit F4 to bring up the options and navigate to the VST plug-ins

section. AudioMulch automatically looks in its own VST plug-ins folder for DLLs, but the browse button can be used to locate a folder of your own.

VST plug-ins, once installed, show up in the list of available modules. They behave the same as the built-in tools and are configured with their own control panels.

AUTOMATION AND THE TIMELINE

In the lower panel of the AudioMulch interface is the automation window. This is where changes to parameters and presets can be stored to create a composition timeline. For instance, it is possible to construct up to 20 different drum patterns in a Drums module and have these alternate over time. This is the equivalent of a pattern list in a regular music sequencer.

To save the current pattern as a preset in any module, click the "?" icon next to the question mark in the top right hand corner of the properties window. A menu containing 20 greyed-out numbers in a grid will pop up. Right-clicking one of these displays another menu that allows the current setup to be stored in the selected slot. Once a handful of presets have been stored, it's possible to switch

between them while the song is playing. Try it out by clicking the play button in the toolbar and selecting different presets in the module.

To have these changes occur automatically, it's necessary to record them in the automation window. Right-click the preset icon — which will now contain a number that indicates the current preset slot. From the menu, select Automate. This will create a new channel or track in the automation window. In the left-hand margin of this track are icons for muting and recording. By clicking the red icon, the parameter represented by that channel will be armed for recording.

To perform a recording, enable the record button in the main toolbar before or during playback. Any changes made to the preset for that module will now be saved. These changes are represented by grey blocks containing the number of the selected preset. After deactivating recording on the track, these blocks can be slid left and right to modify the recording retrospectively.

Unlike presets, automation of parameters (such as volume) are displayed as curves when recorded. Like presets, however, these can be manipulated once the recording is finished and the track is "disarmed".

When a composition is complete, the export options available from the file menu make it possible to save the finished work as a WAV file that can be burned to CD — or compressed to MP3, WMA or OGG as desired. **ETC**



Web development with Ajax, part 2

In the second instalment of our course on Ajax, the web application framework sweeping the internet, *Tim Buchalka* looks at the ready state property.

TIM BUCHALKA

Tim Buchalka is a software developer with over twenty years' experience in numerous computer languages. Since 1998, he has focused primarily on web app development. Tim operates a software development company in Adelaide, Intrinsic Services, and is currently working on several major web apps for release in 2006.



SKILL LEVEL

Intermediate

TIME TO COMPLETE

One hour

REQUIREMENTS

Text editor; web browser.

IN THIS SERIES

- **Part 1 – September '06**
What is Ajax?
- **Part 2 – October '06**
Ready state property
- **Part 3 – November '06**
Web page headers

In last month's Workshop (APC September, page 104) we summarised what Ajax is and listed some of its benefits. We then discussed the XMLHttpRequest object and its role in the process and then dissected a simple Ajax example to give you an idea of how it all works.

If you have not read the first part of this series, I suggest you do so before proceeding any further. You need to be up to speed with the basics of Ajax and, in particular, the XMLHttpRequest object, as it is used quite extensively this time.

THE READY STATE PROPERTY

We touched on the ready state towards the end of the last Workshop, but we will go into more detail with it now so you can understand why it's important and how you should use it.

For now, we will continue working with the JavaScript code we created last month. Below is the `sendRequest` function from that code.

```
function sendRequest() {
    var mobilePhone = document.
    getElementById("mobile").value;

    var url = "mobileServer.html?mobile=" +
    escape(mobilePhone);

    http.open("GET", url, true);

    http.onreadystatechange = updatePage;

    http.send(null);
}
```

Take particular notice of the line that reads:

```
http.onreadystatechange = updatePage;
```

You may recall that this function was used to accept the response received from the server to your browser; in other words, the function was invoked automatically when the server sent a response to your browser. Remember that communication between server and browser in Ajax occurs asynchronously; that is, without waiting for a response. So, your browser sends a response to the server, but does not wait for

a reply. Because the browser is not waiting for a reply, there needs to be a way to get the browser to process the response received from the server when it eventually arrives. The `onreadystatechange` property of the XMLHttpRequest object does just that. Essentially, it instructs the browser to invoke a specific function (in our example, it's the `updatePage` function) when a response from the server eventually arrives. We refer to this type of function as a callback function because the function is not called by other code in your javascript as is usually the case with code you develop; it's called on only by code in the XMLHttpRequest.

Below is the `updatePage` callback function from last month's Workshop, which we will discuss below.

```
function updatePage() {
    var response;

    if(http.readyState == 4) {
        response = http.responseText;
        document.getElementById("mobileOwner"
        ).value = response;
    }
}
```

In last month's Workshop we touched briefly on the value of the `readyState` and indicated that testing for a value of 4 would work on all modern browsers, which in the example above would mean that we would not attempt to process the server response until the value of the `readyState` property was 4 (meaning that the response had been fully received by the browser).

But why are we bothering with all this; isn't the callback function only invoked once when the server response has been received?

The answer is no, the callback function can (and usually is) called multiple times during the process of receiving a response from the server, often every time the `readyState` value changes (but this is browser-dependent).

The value of the `readyState` property can contain any of the values 0 through to 4 as shown below.



REMEMBER THAT COMMUNICATION
IN AJAX OCCURS ASYNCHRONOUSLY,
WITHOUT WAITING FOR A RESPONSE



- 0 Uninitiated — the `http.open()` function has not yet been called.
- 1 Loading — the request has not yet been sent to the server.
- 2 Loaded — the request has now been sent to the server.
- 3 Interactive — the request is being processed, but the server is still sending information.
- 4 Complete — a full response has been received from the server and can be used.

Are you beginning to see why it's important that we test for the `readyState` value rather than just assuming that our callback function is executed when the server response has been received? Your callback function can be called before the request for data is even sent to the server, as well as after a response has been partially or fully received.

If you think about it, this gives you the ability to do some useful things, like updating the screen with a progress bar, popping up an image, or doing something else to show the user the overall progress of the operation; we would do this when the `readyState` had a value other than 4, because when the value is 4 we have completely received the response. Being able to do this means we can make our code a lot more interactive and more user-friendly to the user.

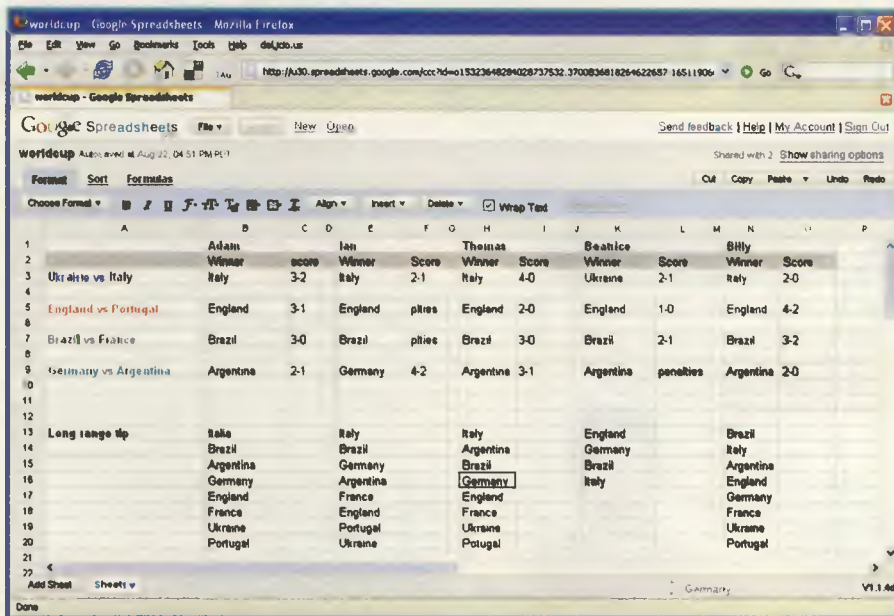
In my opinion, it's very important to try and get your web application working on as many different browsers as possible; this is even more important for Ajax web development and sometimes means a little extra work (or research) to implement.

A good example of this is our callback method. Different browsers execute the callback function a different number of times as the `readyState` value changes! Some browsers execute it each time the value changes from 1 through to 4 — others for only some of the changes.

For example, in my testing when writing this Workshop, Firefox 1.5.0.4 invoked the callback function a total of four times (when the `readyState` property contained the values 1, 2, 3 and 4). Internet Explorer 6, on the other hand, only invoked the callback function a total of three times (when the `readyState` property contained the values 1, 3 and 4, bypassing a call to the callback function when the `readyState` had a value of 2).

All modern browsers will call your function when the value is 4 (complete). Otherwise you would not have any real way of knowing when the response had been fully received from the server.

If you want to see how many times and at what point a particular browser invokes the callback function, add the following line to the `updatePage` function:



Nice results: Google Spreadsheets shows Ajax in action.

```
alert('http.readyState is ' + http.readyState);
```

This will display an alert dialog box each time the function is called.

OK, hopefully you now have a better understanding of `readyStates`, which is a great start, but they are really only part of the picture.

All the `readyState` has done has verified that a response has been received from the server. The response may have been what we were expecting (an owner's name in last month's example), but it may also have indicated an error (page could not be found) or some other error from the server.

THE STATUS PROPERTY

What we really need to do is expand our callback function to test the specific response returned from the server, and process it accordingly. After all, if an error was reported by the server, chances are that the data returned is not what we were expecting. We can test the status of the server response by checking the value contained in the `status` property which, like the `readyState`, is part of the `XMLHttpRequest` object.

Generally, a server will return a response to a request made to it from a browser. You have no doubt seen a 404 error before when browsing the net, which means that the page you requested was not found on the server. This could have been caused by the web administrator moving/deleting/renaming the page (or a typo on your behalf etc.).

The interesting thing to note is that the server would have actually sent a status of the request back to the browser, along with the actual HTML for your browser to render (which

would have been the 404 error in this example). Your browser hides the status from you and just displays the error page. However, we actually want to test the status returned from the server.

So how do we use the `status` property? To check for a 404 error you could use the following code:

```
if(http.status == 404) {
    alert('Received a 404 page not found from the server');
}
```

This is valid and will certainly work, but it's probably better practice to test for a success first (as hopefully this will happen more often, rather than a failure).

We need to modify our callback function to look at the status of the response received from the server (using the `status` property). Once we have done that, then, based on the value, we can process the response accordingly. Below is our first attempt to modify the existing callback function in order to do this (the bold text in the listing is new code that we have added to the callback function).

```
function updatePage() {
    var response;
    if(http.readyState == 4) {
        if(http.status == 200) {
            response = http.responseText;
            document.getElementById("mobileOwner").value = response;
        }
    }
}
```




404 errors indicate that the page you've requested is not to be found on the server.

```

} else {
    alert('Server returned status ' + http.
status);
}
}
}

```

As you can see, we have tested that the `readyState` property has the value of 4 and that the `status` property has the value of 200 (and if this is the case, we have processed the code on the assumption we received a valid response from the server). Otherwise, if the `status` property did not contain 200, we displayed an alert dialog box to indicate an error.

So, rather than testing for a 404 error, we are testing for a successful response and treating anything else as an error.

It's generally not quite as simple as this (for example, one status value returned by a server indicates that the original response was redirected to another web page and may not necessarily be an error, ie. your request may have been automatically redirected to another page where the data was successfully returned. If we just accepted the status in this situation we may well be assuming there is an error when there isn't one!).

See www.w3.org/Protocols/HTTP/HTRESP.html for a discussion on Http Status codes (which the XMLHttpRequest status property effectively is).

The main status codes you would probably want to test for and use are:

200 — the request was successful.

404 — page not found.

500 — internal server error.

301 and **302** — dealing with redirections to new web pages.



TO GET THE BEST OUT OF AJAX ENGINES, YOU REALLY NEED AN UNDERSTANDING OF WHAT THEY ARE TRYING TO ACHIEVE

If you think about it, the 300 series of response statuses should not normally be an issue for the Ajax programmer. The reason for this is that generally you would be developing the Ajax front-end and back-end code yourself (or be part of a team doing this). You would know if a page was going to be redirected — hopefully before it happened — and would then be able to make the necessary change to point to the correct page.

We have discussed the status codes of 200 and 404. An error of 500 usually indicates a problem with the server code.

Note also that there are other error codes you should be aware of (403 — forbidden access etc.), but this will be application-dependent.

THE RESPONSE PROPERTY

The last piece of the pie is the XMLHttpRequest `responseText` property, which you have seen in action in our callback function, as follows:

```
response = http.responseText;
```

This piece of code should be self-explanatory; it simply copies what the server has sent back to the original request made by the XMLHttpRequest object. (In last month's example, this was the mobile phone owner's name.)

The contents of this property could be raw text (as we used it for) or HTML.

SUMMARY

I hope this month has served to give you a better understanding of what happens "behind the scenes" with Ajax requests using the XMLHttpRequest object. You may be wondering why I am going into such "low-level" detail; after all, isn't there a lot of free code out there including "Ajax Engines" that will do all of this stuff for you automatically, right?

This is true, but my opinion is that in order to get the best out of these utilities and engines, you really need to have some understanding of what they are trying to achieve and, more to the point, what is going on "under the hood". This is of particular importance once you hit the limits of the functionality of an engine, or when you try to debug a problem.

Ultimately, having an understanding of what is going on at a low level will make you a better programmer — and that's a good thing.

Anyway, I hope this Workshop has been useful to you. Until next time, enjoy your Ajax endeavours! [ETC](#)

NEXT MONTH

- Now that we've explored the benefits of using Ajax and had a look at some of its basic features, requests and states, in our next instalment we'll delve into the retrieval of web page headers and introduce some concrete example code for you to have a play around with.



Extending Joomla

Extensions can give your Joomla site a lot more functionality. This month, *Peter Sbarski* walks us through a few of the more popular options available.

PETER SBARSKI

Having received first-class honours in Computer Science at Monash University, Peter is currently undertaking a postgraduate degree. He also consults businesses on IT matters and develops custom software solutions. Peter enjoys programming, writing, and fragging opponents.



SKILL LEVEL

Beginner to intermediate

TIME TO COMPLETE

8-10 hours approx.

REQUIREMENTS

An installed copy of Joomla.

INSIDE INFO

- Our Joomla web site www.onjoomla.org
- A collection of components, modules and mambots for Joomla <http://extensions.joomla.org>
- Joomla Developer Projects <http://developer.joomla.org/sfmain/do/listProjects>
- VirtueMart www.virtuemart.net
- Facile Forms www.facileforms.biz/wiki
- MgMediaBot www.needful.de/joomlaaddons.0.html

Get the language ISO code using the language editor.

Last month (APC September, page 108) we had a look at components, modules and mambots for Joomla; the big ones, JoomlaXplorer, DOCMan and Community Builder, and smaller ones, MamBlog and Userlist XTD. However, we're not done yet. There are some other amazing extensions to convince you that Joomla is a remarkable effort.

SPEAK LANGUAGES

Joom!Fish is an extension for managing multilingual content on Joomla. The United Nations Regional Information Centre for Western Europe, for example, uses Joom!Fish to translate its site into 13 languages.

Like most other extensions, Joom!Fish is easy to install and configure. There are, however, a couple of things you need to know. Download Joom!Fish from www.joomfish.net and install it as a component. To add a new language to your site, in Joomla's Control Panel click on Language Manager — or click Site > Language Manager > Site Languages. Click on New and upload the necessary language pack.

Language packs for Joomla can be found at <http://developer.joomla.org/sfmain/do/listProjects> or just by Googling. You will not be able to use a language unless you install the necessary language pack first. Once the language is installed, find it in the Language Manager and click on it. Scroll down until you see a line which starts with `DEFINE('LANGUAGE','xx')`. ① Write down the

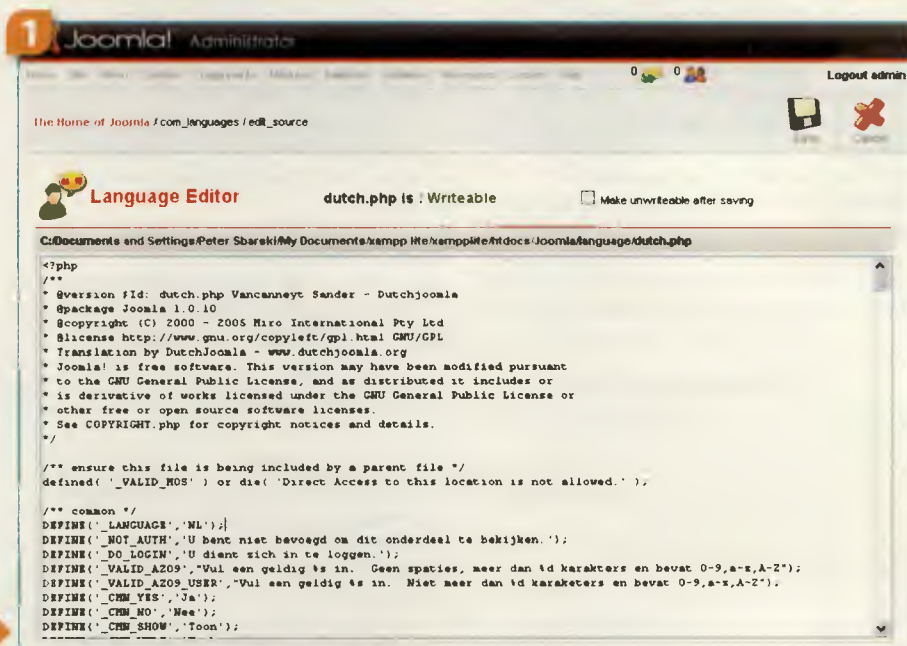
THANKS TO YOU!

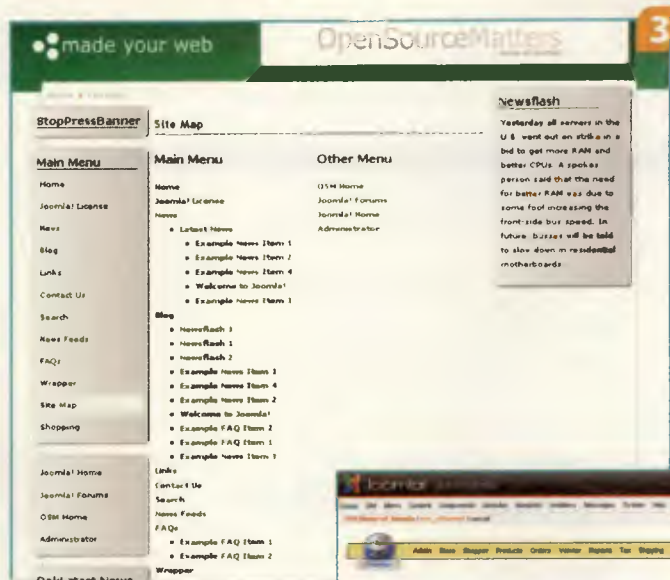
We'd like to say a big thankyou to all our users at www.onjoomla.org. The last time we looked we had over 60 registered users. Thankyou to Ilia, bdude, Latent_Image, Norm, ronmcfarlane, randomiser, Namsul, jster11, Viperfish, edwinirelf, Dynalinx, brad, moonie, lot and many others. Thanks for your feedback and active participation. We truly appreciate it.

letters in place of 'xx'. For English, these two letters would be 'en'; for French they would be 'fr' etc. This is the ISO code that you have to use for Joom!Fish.

Next, click on Components > Joom!Fish > Languages. English should be the first language in the list and it should already be activated. Activate the second language by clicking on the Active box next to it. Enter its ISO code and set its ordering to two. The translation process may seem daunting, but it does become easier over time. Joom!Fish can be used to translate just about everything, including all static and dynamic content, menus, polls, newsfeeds, modules, web links etc.

To translate, click on Component > Joom!Fish > Translation. Under Languages, select your new language. From Content Elements, choose the element you wish to translate. Just for this example, select Menus. ② Your menu entries will appear on





A neat two-column site map.

VirtueMart's Control Panel reminds us of something...



the page. Click on each menu item and add a new translation. Don't forget to click Save.

You should immediately preview your changes to make sure that everything is working. On the front end, to change to a different language, click on the Languages drop-down box. If you don't see this box, click on Modules > Site Modules (in the Administrator Console). Look for Joom!Fish language selection. Make sure that its position, "user3" by default, is compatible with your template.

If you need more help with Joom!Fish, click on Components > Joom!Fish > About. The links on the right-hand side should be quite useful. You can also join us at www.onjoomla.org and ask questions.

SITE MAP

If you want a nice site map for your site, JooMap, formerly Mambo Map, is the only component you will ever need. Download it from <http://developer.joomla.org/sf/frs/do/viewSummary/projects.joomap/frs> and try it out. We like the way it looks but, if you don't, there is a straightforward way to edit its CSS file. In the Administrator Console click on JooMap and then click on the CSS tab. You can also tweak some parameters in the Display tab.

We, for instance, prefer the two-column view rather than the default one-column layout. JooMap also supports third party plug-ins, which makes it compatible with other components. (It works with Google Sitemaps too).

ONLINE SHOPPING

VirtueMart is a very powerful shopping cart solution for Joomla. If you are interested in selling anything on your web site, VirtueMart should be the first



JOOM!FISH CAN BE USED TO TRANSLATE JUST ABOUT EVERYTHING, INCLUDING ALL STATIC AND DYNAMIC CONTENT

component to consider. Grab a copy from www.virtuemart.net or from <http://sourceforge.net/projects/virtuemart>.

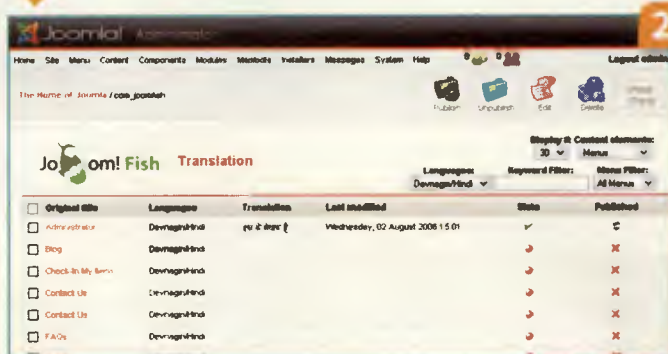
The scope of this component is enormous. It has so many features it puts some proprietary solutions to shame. Here is a quick rundown of different sections in VirtueMart and what you can do in them.

In the Admin section, you can tweak the general settings of your shop. Here you can change basic price, user and tax configurations, modify front-end features, make changes to display and layout and modify shipping, checkout and download settings. You can also view registered shoppers and check their billing and personal information.

The Store section is where the real magic begins to happen. Here you can create and edit your store, add payment methods and credit card lists. Shipping modules can be configured as well. Incidentally, VirtueMart comes with an Australia Post shipping module.

The Products section is where you will spend most of the time. Here you will create your categories of products and add individual items. Remember that each product has to be assigned to a category (it is possible to assign to multiple categories). Product information like dimensions and weight can be specified in the product information area.

Joom!Fish: click and translate.



The Shipping section will help you to set up shipping rates and the Tax section will help with the tax rates. Other categories include Orders, Manufacturers and Coupon. The Reports area will help to configure and generate sales reports. There is another section called Vendor — although in version 1.0.6 it didn't work.

VirtueMart is a capable component with a lot of potential. While it is hard for us to evaluate in terms of performance and security, there are at least a few hundred online shops that use it right now. You, however, should evaluate VirtueMart for yourself first before deciding to open the next Amazon.com.

ONLINE FORMS

The fact that Joomla users call this component "absolutely great" should say a lot about its capabilities. Facile Forms can be used to create gorgeous online forms for things like surveys. There are companies that spend thousands to come up with something like this. You can have it for free.

Get a copy of Facile Forms from www.facileforms.biz. Grab the component, module and the mambot. Install the component first and run it. Facile Forms will ask you to install or update database tables. If this is your first time installing Facile Forms, select New Install.



5 made your web

OpenSourceMatters
Home of Joomla!

StopPressBanner

Main Menu

- Home
- Joomla! License
- News
- Blog
- Links
- Contact Us
- Search
- News Feeds
- FAQs
- Wrapper
- Site Map
- Shopping

Latest News

Newsflash 1
Newsflash 1
Newsflash 2
Example News Item 1
Example News Item 4

Popular

Welcome to Joomla!
Example FAQ Item 2
Example FAQ Item 1
Example News Item 4
Example News Item 1

Newsflash

Yesterday all servers in the U.S. went out...
bid to get more...
better CPUs. A...
person said...
for better RAM...
front-side bus...
future, buses...
to slow down in...
motherboards.

Use Facile Forms for all your online form needs.

6

FacileForms 1.4.6
Contact form Page 1

ID	Name	Type	Published	Params	S	T	Steps
1000	cf_jlives	Static TextField	✓	33px 13px			
1001	cf_name	Text	✓	81px 40px			
1002	cf_lastname	Static TextField	✓	81px 50px			
1003	cf_email	Text	✓	51px 70px			
1004	cf_password	Static TextField	✓	81px 80px			
1005	cf_confirm	Text	✓	307px 80px			
1006	cf_message	Static TextField	✓	81px 120px			
1007	cf_message	Textarea	✓	120px 120px			
1008	cf_submit	Regular Button	✓	81px 22px			
1009	cf_security	captcha	✓	341px 32px			
1010	cf_security	captcha	✓				

FacileForms - Page Layout

Page Layout

Name

Email

Your Message

7

Letterman Global Settings

Parameters

Extended email address validation? ☐ No ☒ Yes

Embed images into the email? ☐ No ☒ Yes

Number of personalizable mails to send per step?

Number of mails to send per step?

File attachment directory:

The CSS styles which are used to style the HTML newsletter

```

/* general stuff */
body {
margin: 0;
padding: 0;
text-align: center;
font-family: verdana, arial, sans-serif;
}

```

VirtueMart's example shop.

Configure the style sheet for your Letterman emails.

IT MAY TAKE A LITTLE BIT OF TIME TO UNDERSTAND EVERYTHING, BUT IN THE END YOU'LL BE ABLE TO DO (ALMOST) ANYTHING

Also click on Sample Forms if you want to have a few examples to go by. We recommend that you do this. The configuration step can be left alone for now. The only thing you may need to change is the default email notification address.

A full walkthrough of this component is beyond the scope of this Workshop, so we recommend the following: before trying to create your own form, have a look at the example forms. Click on Components > Facile Forms > Manage Forms. From Package, select Samples > Contact Form.

It may take a little bit of time to understand everything but, in the end, you will be able to do just about anything. For help on Facile Forms consult www.facileforms.biz/wiki and www.facileforms.biz/forum.

MULTIMEDIA STREAMING

The most popular Joomla extension for streaming video and audio is MgMediaBot. This mambot can play multimedia files directly in a content item or in a pop-up window. It supports RM, WMV, WMA, MPG, AVI, MP3, MOV, MP4, FLV and SWF formats. Grab the latest copy of MgMediaBot from

www.needful.de/joomlaaddons.0.html and install it as a mambot. Then, go into Mambot Manager and enable it.

To use this extension, upload your media files first. Use the Media Manager or FTP the files across. Put your files in a directory you won't forget. The developer of this bot suggests /images/stories/video. Now you just need to add one of two lines to your content item to integrate the multimedia file.

If you want the file to play in a separate pop-up window, add the following: `{mgmediabot}images/stories/video/myvideo.avi[true(Click here to play video)]250|250/(mgmediabot)`. If you want the media file to play in line, add: `{mgmediabot}images/stories/video/myvideo.avi[false]250|250/(mgmediabot)`.

The two numbers, ie. 250|250, represent the width and the height of the display area. The true/false flag is used to decide whether to use a pop-up window or not. If you do use a pop-up window, provide a link title as per the example.

QUICKIES

RokLatest is an enhanced version of the "latest news" module for Joomla. Built on moo.fx,

a lightweight JavaScript effects library, RokLatest is very smooth and beautiful. It's highly customisable as well. Grab it from: www.rocketheme.com/Products/Joomla_Extensions/RokLatest.

As described on <http://extensions.joomla.org>, the StopPress Banner Module will pop up a DHTML box containing a banner when people visit your site. It's like a miniature pop-up window but not as annoying. It even has a Close button. Grab this module from www.templateplazza.com/component/option,com_remository/Itemid,27/func,fileinfo/id,33.

The Letterman extension is an effective mailing list solution. You can use it to manage newsletters and subscribers. It comes with a sign-up module and a search bot. You will find it easy to use. Get it from <http://forge.joomla.org/sf/projects/letterman>.

If we've missed your favourite extensions, or if you have a question, don't hesitate to give us a shout on our forums at www.onjoomla.org. We hope to see you there!

NEXT MONTH

In our next instalment, we'll discuss ads, track users, and go through some tips and tricks.

Integrating Linux, part 4

Linux can work with Exchange — or replace it — to provide you with more email options, explains *Jarrod Spiga*.

JARROD SPIGA

Jarrod Spiga is an infrastructure and network engineer who specialises in getting Linux and Windows systems happily coexisting with each other. He currently holds CCNA and numerous MCP certifications and dabbles in web application development in his spare time.



SKILL LEVEL

Advanced

TIME TO COMPLETE

Three hours

REQUIREMENTS

- An installation of Linux (CentOS 4.3 and Red Hat Enterprise Linux ES 4.0 instances were used in the writing of this Workshop) with Perl and PostFix installed; an Active Directory-based Windows domain; one Windows Client (Windows XP SP2 and Windows Vista Public Beta 2 used here); an internet connection.

IN THIS SERIES

- Part 3 — September '06
Print services
- Part 4 — October '06
Email services
- Part 5 — November '06
Web server authentication

Two of the biggest concerns that prevent many small businesses from utilising Windows-based email solutions are security and the cost of licensing. While things have improved significantly of late, most small businesses cannot justify the costs of implementing both the front-end and back-end Exchange deployments that Microsoft recommends for a secure and reliable email infrastructure. Another area where Linux servers can be of use in a Microsoft technologies network is email redundancy and segregation.

Say that you have a single Exchange server within your organisation. You have concerns about connecting this server directly to the internet (since any undisclosed vulnerability could potentially expose any mailboxes on the server to the world, even on a fully patched server), but without being connected to the internet, your Exchange server cannot send or receive email. To solve this problem, one could build a Linux server to securely relay messages between your Exchange server and the internet and to filter out spam, viruses and other email that you don't want using various open source tools. Add a firewall to your configuration and you have a complete, demilitarised email infrastructure.

Alternatively, you may not use an Exchange server at all within your organisation, instead choosing to utilise a Linux-based offering. Even in cases like this, there's no reason why you cannot leverage off an existing Active Directory infrastructure to provide email services for the users on your network.

LINUX FRONT END

The easiest way to configure the PostFix SMTP server to act as an Exchange front-end server is to simply relay all messages directly to your Exchange server. However, implementing such a solution can introduce major problems — PostFix will accept all email sent to your domain, whether any given message is sent to a valid recipient or not. If the recipient does not exist, Exchange will generate a non-delivery report (NDR). Having PostFix not reject the invalid user upfront and having Exchange generate an NDR is one very easy way to get your mail server listed in spam databases — something you'll want to avoid.

In order to get PostFix to reject messages sent to invalid users, you should implement a script that regularly queries the Active Directory and generates a list of valid users. This list can then be mapped into a recipients database which PostFix

can use to filter out the good mail from the bad. One such Perl script that does the job well can be found at <http://www-personal.umich.edu/~malth/gaptuning/postfix/>.

This script requires that the **Net::LDAP** Perl module is installed on your server. To install this module, execute the following as the root user:

```
perl -MCPAN -e shell
install Net::LDAP
```

If you have never used the Comprehensive Perl Archive Network (CPAN) before, you'll need to configure it before executing the second command. This process is simple thanks to the wizard-based options provided.

Once **Net::LDAP** is installed, edit the script in your favourite text editor. Set the **\$VALID** variable to **/etc/postfix/recipients** and enter in the fully qualified domain names for your Active Directory controllers as the **\$dc1** and **\$dc2** variables (if you only have one AD controller, you can enter the same name for both variables).

By default, the LDAP data stored within the Active Directory is off-limits to unauthorised users. Back in part 1 (APC July, page 114), we created a new user account in your Active Directory for the purposes of binding to your Active Directory.

If you have forgotten the details of this account, load up your **/etc/ldap.conf** file and note the values assigned to the base, binddn and bindpw directives. These need to be assigned to the **\$hbase**, **\$user** and **\$passwd** variables respectively in the Perl script — just ensure that you surround them in quotes. After you have configured these variables, save the script and exit from your text editor.

Execute the script and then observe the contents of the **/etc/postfix/recipients** file — it should contain a list of all of the recipients for users located under the base OU in your Active Directory, followed by "OK". Once the recipient list has been generated, you need to convert the list to a format that is able to be read by PostFix. Executing the following command should take care of that:

```
postmap recipients
```

The last step to getting a working configuration is to edit your PostFix configuration file (**main.cf**). Ensure that all of the domains that you wish to relay are listed under the **relay_domains** directive (they should not be listed under **my_domains** unless local delivery is required). The relayhost directive should



Exchange extensions: the proxyAddresses attribute is added once Exchange is installed on your domain. This attribute holds all of the email addresses for each user in the Active Directory.

Mailbox specification: the second script checks the value of the E-mail field under the properties screen for each user and uses the value to create a virtual mailbox under PostFix.

be the address of your Exchange server. Lastly, the `relay_recipient_maps` directive should be set as follows:

```
relay_recipient_maps = hash:/etc/postfix/
recipients
```

Once you save the configuration and restart PostFix, your Exchange front end should be fully operational. The last thing to do is to automate the generation of the recipients list (in case users are added or deleted from the Active Directory). This can be achieved by adding the following line to the end of your `/etc/crontab` file:

```
00 * * * * root cd /etc/postfix ; ./getadsmtp.pl
&& postmap recipients
```

THE ALTERNATIVE TO USING EXCHANGE

The basic principle for what is shown above can also be used to set up a completely Linux-based mail system. Instead of only filtering recipients based on the email addresses provided in your Active Directory, PostFix can be configured to store email for your Active Directory user



THERE'S NO REASON WHY YOU CAN'T LEVERAGE OFF ACTIVE DIRECTORY TO PROVIDE EMAIL FOR YOUR USERS

accounts. This can be done with a quick edit of the PostFix configuration to enable virtual mailboxes and by slightly modifying the Perl script that generates the list of recipients.

In order to get virtual mailboxes set up under PostFix, you need to create a generic user account that "owns" all of the mailboxes (PostFix will use this account in order to create the mailboxes and to deliver mail). This account can be a new Active Directory account, but setting up a local Linux account for this purpose generally provides better performance and more flexibility:

```
adduser vmail
```

Whichever you set up, be sure to note the `uid` and `gid` for this account. You can quickly find this information by looking at the tail of the `/etc/passwd` file:

```
tail /etc/passwd
```

Once the user account has been set up, create the `/var/mail/vhosts` directory and change the group and user ownership to this new account:

```
mkdir /var/mail/vhosts
chown vmail:vmail /etc/mail/vhosts
```

It's now time to modify your PostFix configuration to accept delivery of your messages. Edit the `/etc/postfix/main.cf` file and search for the `virtual_mailbox_domains` directive. Ensure that the domain names that you want to receive email for are listed after this directive. For instance:

```
virtual_mailbox_domains = 1337.as, spiga.id.au
```



ONCE YOU'VE MADE THE CONFIGURATION CHANGES AND RESTARTED POSTFIX, IT'S TIME TO GENERATE YOUR MAILBOX NAMES

While you're at it, make sure that these domains are *not* listed after the `mydestination` directive. If the domains are listed after this directive, PostFix will attempt to save mail messages in each user's home directory instead of using the virtual mailboxes. Unless every user in your AD infrastructure logs in to your Linux system, this behaviour is unlikely to be desirable.

Next, set the base directory for your virtual mailboxes and specify a location to a new configuration file which will contain the list of valid recipients (you'll create this file shortly):

```
virtual_mailbox_base = /var/mail/vhosts
virtual_mailbox_maps = hash:/etc/postfix/
vmailboxes
```

PostFix also needs to know what uids are valid for your recipients. This is a safety mechanism, designed to prevent PostFix from being able to overwrite files owned by higher-privileged users. When we extended our Active Directory schema in part 1, we set a minimum Linux uid for all of your accounts (which is 10000 by default). Assign this value to the `virtual_minimum_uid` directive. While you're at it, set the `virtual_uid_maps` and `virtual_gid_maps` so that they match the uid and gid for the account you created earlier:

```
virtual_minimum_uid = 10000
virtual_uid_maps = static:500
virtual_gid_maps = static:500
```

Lastly (and optionally), you can set the `virtual_alias_maps` directive to point to another local file that redirects and messages to local mailboxes that are located under each user's home directory (and not a virtual mailbox as such). This can be useful when you have some users who do regularly log in to this Linux system, allowing them to use Pine or another local email client to access the messages stored under their home directory. This directive should point to a second new configuration file:

```
virtual_alias_maps = hash:/etc/postfix/virtual
```

To illustrate this last point, assume that Sel logs in to this Linux system on a regular basis, but John and Peter do not. In order to allow Sel to read and compose email directly on the local system, you could add the following line to the `/etc/postfix/virtual` file:

```
sel@spiga.id.au sel
```

Once this line has been added, the `postmap /etc/postfix/virtual` command should be executed to apply the hash to this alias. Once this has been done, any email that would normally be delivered to Sel's virtual mailbox will be redirected to the mailbox located under his home directory. The `/etc/postfix/virtual` file should not contain entries for John and Peter though, because they do not directly log in to the Linux system and they have no home directories as a result — their mailboxes need to remain as virtual ones.

Once you've made the necessary changes to the configuration and restarted PostFix, it's time to start using the Perl script to generate your mailbox names. For the most part, the script to do this is identical to the one that is used to obtain a full list of email addresses on an Exchange server. I have made a couple of modifications to this script though in order for it to work with Active Directory schemas that have not been extended by Exchange. This script can be found on our web site at www.apcstart.com/dload and goes by the name of `getadmail.pl`.

Specifically, the `proxyAddresses` attribute does not exist in non-Exchange environments, so the script instead checks the value of the `mail` attribute for each user account. This attribute can be set from under the E-mail field, located under the General tab under the properties for each user in the Active Directory Users and Computers MMC snap-in.

In order to get your virtual mailboxes automatically created once a new user account

has been created, set up the following cron job after copying the script to the `/etc/postfix` directory and modifying it as described above to suit your environment:

```
00 * * * root cd /etc/postfix ; ./getadmail.pl &&
postmap vmailbox
```

GETTING YOUR MAIL

Now that PostFix has been configured to receive email destined for your users, all that remains to do is arrange for a mechanism for your user to be able to retrieve their email. Dovecot is a lightweight POP3 and IMAP server that is useful for such purposes and requires minimal configuration in order to get to work with PostFix. Once installed, only a few directives need changing within the `/etc/dovecot.conf` file in order to allow the user to log in using their Active Directory credentials (which is done using the Kerberos libraries and PAM).

Ensure that the `auth_passdb` directive is configured to use PAM and that the `auth_userdb` directive is configured to be static and using the vmail account we created earlier. For instance:

```
auth_passdb = pam
auth_userdb = static uid=500 gid=500
```

Save these changes and then edit the `/etc/pam.d/dovecot` file (or create it if it doesn't exist) and ensure that the contents of the file are as follows:

```
auth    required pam_krb5.so no_user_
        check
account required pam_permit.so
```

Provided that the Kerberos settings that you configured in part 1 are still correct, your users should be able to log on to both the POP3 server and the IMAP server that Dovecot provides. [\[1\]\[2\]](#)

NEXT MONTH

- In the final instalment of this Workshop series, we configure the Apache web server to also access data within an Active Directory.

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Mastering Video, part 7

So far this series has shown you how to go from raw footage to a fine-tuned piece of cinema you'd be proud to show your friends and family. *Seamus Byrne* adds the final polish.

SEAMUS BYRNE

Seamus Byrne first got his hands on the family Super8 in the early '80s and was hooked. Moving onto video soon after, he made many short films in the backyard, testing the limits of in-camera trick photography. Come the '90s, Seamus was quick to adopt digital editing technology as he moved into professional video direction. Having managed multi-camera shoots with artists including the Foo Fighters and Fatboy Slim, he also regularly works on short film projects for the film festival circuit.



SKILL LEVEL

Beginner to intermediate

TIME TO COMPLETE

30-45 minutes

REQUIREMENTS

Software install files (plus your own footage).

IN THIS SERIES

- **Part 6 – September '06**
Creative transitions
- **Part 7 – October '06**
Effects and filters
- **Part 8 – November '06**
Preparing for distribution

Our examination of effects and filters this month really boils down to a look at the tools available to help make your video look as good as it possibly can. There are many effects to play with, but there's little use in going one by one through the range of options. Jump in, play around and have some fun with them to discover the effects options you like.

If there is one main tip to keep in mind, it is to use flashy effects sparingly. The more you use them, the less impact they will have. So, get to know them by messing around with them, but use the ones you love when you really want to make something snap.

There are two main areas we'll delve into this month. The first is a quick note on applying multiple effects and filters to the same clip, and the second is colour adjustment — where you can dramatically alter the final look and feel of your video through the use of colour effects.

MULTIPLE EFFECTS AND FILTERS

When applying multiple visual effects on a clip (or audio effects, for that matter), it is important to remember that they stack from top to bottom. Applying effect A and then effect B will give a different result to applying effect B then A. Take this to be a bonus — by swapping filters here and there you may find something gives you a better look than you first expected.

This is also important if applying a Broadcast Safe filter to ensure your colour range is suitable for television (we'll look at this next month). You must run this filter at the end of a list of filters to be sure it is doing its job — applying it before a different change in colour saturation, for instance, would completely override it.

Note that Avid Free DV doesn't really have any multiple effects options to play with. As discussed on previous occasions, Free DV delivers only a basic effects set, with a range of transition options and a Color Effect set of filters. We'll look at these in detail shortly.

ADDENDUM TO PART 6

Quick transition item in Avid Free DV. I failed to mention in the last issue, while discussing transitions, Avid Free DV also has a Quick Transition tool, which will help make things very easy if you just need to drop in a standard dissolve or fade. It's the fifth button from the left on the Timeline menu (and delivers the main transition controls in a single, easy-to-use window).

COLOUR ADJUSTMENTS

Applying colour filters to your video at this stage is real make-or-break editing. If you have watched your fair share of deleted scenes and outtakes on movie DVDs, you will have spotted some scenes that look pretty rough in terms of colour and general image depth and quality. This is because a colour correction process has added a great deal of final polish.

Likewise, many films use colour to give a visceral sense of emotion to a scene (or entire production). Films like *Traffic*, *Three Kings* and the recent *Domino*, plus many more, have used dramatic colour filtering to great effect. This is an area where you should play with pushing things a little further to see where it can take your production.

Beginners often spend too much time playing with overt, tacky effects. Your work will look much more professional if you spend that time playing instead with more subtle image adjustments. As the image moves to take on a more stylised look, you also begin to blur the line between video and film production values.

AVID FREE DV

As mentioned above, multiple effects layers are unavailable in Free DV — mainly because there are very few effects on offer. If we head back into the Effects tab in the Project window, you will see we only have the transitions, as discussed last month, and an Image item that only offers a Color Effect as an effects option. Don't fret. This single option packs a lot of punch.

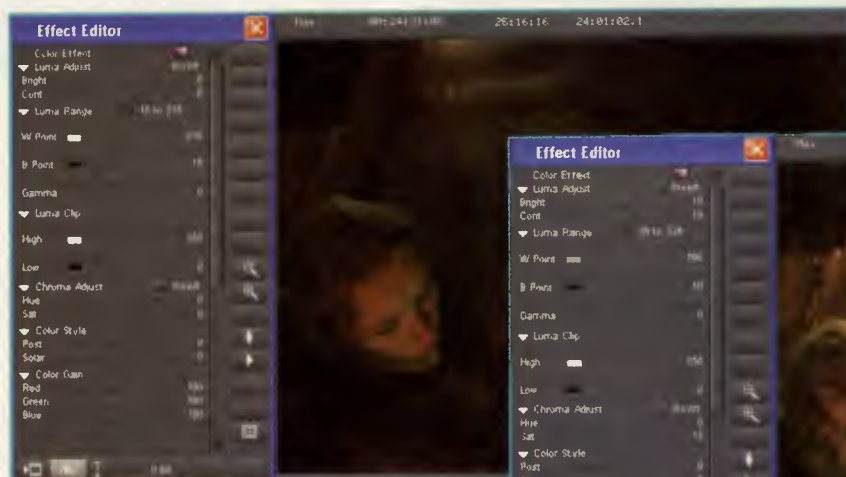
Once you have a clip selected in the timeline, double-click Color Effect in the Project window to add this effect to the clip. If it isn't still open, remember the Effects Editor is found in the Tools menu — and it is where you gain access to the Color Effect controls. There are six sets of options available, each offering very different image adjustments. We'll take a look through them one by one.

Luma Adjust

This is a pair of traditional brightness and contrast controls, as well as an inverter. Luma Adjust works very well when used in combination subtly with other effects.

Luma Range

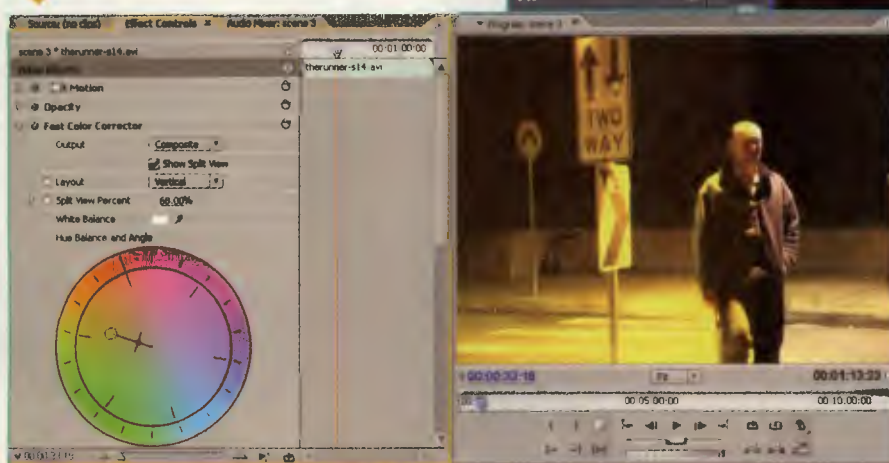
Something akin to levels controls in an image editor, Luma range lets you set the white point and black point levels in the image, as well as the Gamma level. Both subtle and harsh use of these options can make for some interesting effects.



The results from using the filters on Avid Free DV before (left) and after (below).



Adobe Premiere Pro's Effect Controls tab.



Luma Clip

This tool lets you set upper and lower cut-off points for the available luminance range. You may find this jumps from too subtle to too intense very quickly.

Chroma Adjust

Here you will find hue and saturation sliders, along with an Invert option. Saturation can give excellent effects, whether you make colours more subtle by pulling back or pushing it out to a hyper-real state. Hue can completely change the complexion of your video, spinning all colours around the colour wheel.

Color Style

An actual "effect" option, with both posterise and solarise effects on offer. Test liberally, but try to have a really good reason for using either in a final production.

Color Gain

Red, green and blue sliders are here, letting you reshape the overall colour blend of your clip. You can use it carefully to offset bad lighting in the original shoot, or you can use it dramatically to shift your whole scene into harsh yellow, sinister green (for a night-vision effect) or a cooling blue tint.

ADOBE PREMIERE PRO

There are a lot of options available here — and a lot more detail available in the control set as compared to Avid Free DV (which is a free app meant to encourage you to upgrade at some point, after all).

You will find the main options appear in the Effect Controls tab (part of the Source window). Here is where you will control the order of effect layering as well as the specific controls in each effect. Motion and opacity effects options are always found here, and they are always at the top of the tree (they're really outside the tree, as nothing else changes what they do).

Down in the Effects tab on the bottom left, you will find a lot to choose from inside the Video Effects folder. We will look at three folders in particular, as these are where the main colour adjustments can be found.

Adjust

A lot of the important and faithful adjustments are found here. These include: Levels, which gives a histogram to work with; Color Balance, which gives control across shadow, highlights and mid-tones for excellent detail management; and ProcAmp, the

best tool for working with brightness, contrast, hue and saturation all in one set.

Auto-adjust options are here too, for levels, colour and contrast. What is very nice about these is they include options for blending the auto-adjustment with the original image — so you can manage the degree to which the software automatically tweaks the picture.

Color Correction

Here are the tools for reshaping the fundamentals of your clip's colour tint. A good place to start is the Fast Color Corrector, which offers a colour wheel as the focal point of your hue and balance adjustment. It will help you get a grip on how this kind of control works, before you leap into the more complex Three-Way Color Corrector — which gives a colour wheel for each of shadow, mid-tone and highlight.

Image Control

These are heading down a truer effects path, with straight-out colour changes like Black and White, Color Replace, Tint, Equalize and Color Pass (this last one offering the chance to make just one colour pop out in a scene). As an alternative to some of the above correction tools, Color Balance options are also found here.

If you want to get really advanced, Premiere Pro also offers an animation toggle for every effect option, allowing you to change the settings over time. You can then add key frames to the timeline in Effect Controls and adjust the intensity of the effect over time — or even any of the individual effect settings. Working carefully with this temporal option can take your game to a whole other level. **TIME**

NEXT MONTH

It's a wrap! We're done, and now it's time to distribute it for all the world to see.

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1 Marantz RC-5400

It's universal remotes like this that give home theatre some serious geek cred — this thing can be programmed via your PC to control your TV, DVD player, VCR, stereo and home cinema receiver. Also, at \$1,199, it has the price tag of a PC. This model includes a touchscreen, PC link cable, docking station and 8MB memory. In addition to switching your TV on and off, the RC-5400 will also "Shape ideas, take your creativity to a new level and enjoy the endless control in Marantz style." (Just in case you weren't convinced.)

2 Linux for Dummies, 7th edition

If you can boil a jug of water you can be a Linux user, says the intro. For some reason they also think we might need a book, so here is 400 or so pages on Linux setup, using the command line, playing with KDE, something called "network holes", Open Office.org, and what to do if you forget your password. If you are remotely familiar with Linux, you've heard it all before. Otherwise, this is your entry into a fantastic world where freedom reigns! <Cough> You also get Fedora Core and Knoppix on DVD.

3 40 iPod Techniques

There's some nice touches here — handy info like the fact that Apple no longer sells iPod's that don't have a photo display feature (except shuffle). But you've already bought an iPod haven't you, you trendoid? In that case, you can read here about loads of accessories and how to sort through songs and navigate your iPod's many features. It's a little over the top — two pages about cases? — but if you've forked out a few hundred dollars for the thing you might as well get serious about it. There's even a chapter about caring for your iPod.

4 Crumpler 2 Million Dollar Home

It's not two million dollars, but it does hold your large digital camera, a digital video camera or a bunch of techy gadgets better than a shopping bag. This one's filled with internal pockets and Velcro release flaps, and it also has an adjustable shoulder strap. The water resistant shell is a nice touch, as is the padding so your new Nikon doesn't get wrecked. Crumpler makes a range of these courier-style sling-over-the-shoulder bags, so if you don't like this one check out the web site. Put your stuff in it and use it as a pillow or fashion accessory.

CONTACT Qualifi
WEBSITE www.qualifi.com.au
PRICE \$1,199
VERDICT ★★★★★

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VERDICT ★★★★★





Titan Quest

Declan Kennedy gets maced again and finds love.

CONTACT THQ
ONLINE <http://titanquestgame.com>
PRICE \$89.95

✓ Some stunning visuals; rich character-development system.

✗ Unnecessary fixed camera; taxing visuals may smote thy PC.

VERDICT ★★★★★

"Fire? Check. Marshmallow stick? Check. Marshmallows...? Marshmallows...? Octavius — did you forget the marshmallows again...?"

Titan Quest (TQ) is an isometric 3D RPG with heavy emphasis on character development and click-and-slash combat. The setting is the world of Greek myth and legend, with a considerable amount of authentic lore thrown in for the comic-book shop guys out there.

Now, let's just get this out of the way first; it's a shameless Diablo clone. Actually, shameless isn't even a strong enough word. TQ feels more like a loving total conversion.

Thankfully, it's also a rather good hack-and-slasher, with impressively deep character talent trees and a few nice touches which set it apart from the rest. One of the biggest differences between TQ and most other RPGs is the way that classes are implemented.

In many RPGs, a player will select a class when they create their character — and the skills they develop throughout the game depend on which class they chose initially. TQ allows the player to select a skill tree (called a "mastery") after their first experience level, and a second one after their eighth level.

Now, every good RPG-monkey knows that the heart and soul of any sword-



and-sandals ripsnorter is *teh phat lewtz*. TQ features a comprehensive item database which is colour-coded to indicate rarity and quality.

All of the items are visible on your avatar during play and can be dyed with materials bought from vendors in towns. Considering that Games Editor Dan Chiappini has been wandering around Azeroth in a pink dress [Ed — It's a robe!] for months, this is clearly a must-have feature.

Interacting with the world is a point-and-click affair; most of the game can be enjoyed one-handed if you're so inclined. While this sounds useful, it's where my biggest gripe with the game rears its all-too-familiar head — fixed camera perspectives are the work of Satan.

Because TQ is such a loving homage to Diablo, developer Iron Lore has decided that the game needs to force the same perspective too. You can zoom in and out,



but you can't rotate the camera — something that every single other 3D RPG or RTS lets you do.

You may have the best loot database, the most intuitive controls and the cleverest skill system in the history of gaming — but if the player can't exercise a fair amount of control over their perspective on the action, then the action fails to satisfy.

Overall, this is the next best thing to Diablo III for the die-hard fans out there who have given up on Blizzard ever making another instalment in the series. Just don't expect the same level of quality.



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PREVIEW

Just Cause

Dan Chiappini brushes up on his Spanish and takes a lesson in political dissidence.

Let me just start by saying that any game that sees you jumping out of a cargo plane and freefalling thousands of feet before yanking your chute and mowing down cronies on a beach is A-OK by me.

Just Cause sees you playing the role of a regime-change specialist agent with a seemingly unlimited budget and arsenal — a deadly combination.

The vast, open-space missions and check points are so geographically dispersed you'll want to do as little running as possible: if you're stuck out in the middle of nowhere and you've trashed your car, drop a flare to call a replacement vehicle.

More than 90 vehicles are available to explore the massive islands by land, sea and air, with everything from police paddy

wagons and mopeds to jet skis and helicopters at your disposal.

The real fun comes from innovative gameplay elements such as the grappling hook, which allows you to hitch a ride on passing vehicles before reeling in the line and booting out the driver. You can even go into stunt mode and let your ride cruise along with you on the roof before

bailing (and stealing something with a little more go).

Gaining rep with the factions within the game (ranging from drug cartels to revolutionaries) unlocks additional features, such as weapons, safe houses and garages to store your wheels.

The game looks amazing (it has the most motion blur we've ever seen), and between the main story and sideline quests, this one should keep you busy for quite some time.



CONTACT Atari
ONLINE www.justcausegame.com
PRICE \$89.95

✓ Amazing visuals; car-jumping and parachutes.

✗ Huge world; major time-sink.

RELEASE DATE: OCTOBER 2006

Joint Task Force PREVIEW

Nick Race arms up to keep the peace.

HD Interactive enjoyed massive success with its RTS game Codename: Panzers, and its military theme has returned with Joint Task Force. JTF is a 3D RTS with emphasis on the tactics. In a crack group of US military rangers, you're tasked with keeping the peace in trouble spots by using high-velocity rounds.

The missions range from simple protection to assassinations, destroying SAM sites and cleaning out mercenaries. The plot follows the

tried-and-true "track down the origins of the terrorist activities — right back to the fundamentalist drug cartel roots"; nothing original here. Battles take place in Afghanistan, Iraq, Bosnia, Somalia and South America, all with gorgeously rendered landscapes.

JTF has an interesting feature in an ever-expanding map. Once an objective has been reached, the map will often expand in a new direction, continuing play without reloading another theatre. Another aspect not



seen before is the presence of the media. When under scrutiny, make sure your team's actions see you looking like the good guys! Some missions involve you having to specifically raise your profile; keeping the press on your side means more funding too, so try to keep them alive.

There's no building or resource management apart from basic cash reserves, which are topped up when objectives are completed. The money allows your team commander to purchase new units or secondary weapons and call in air strikes or satellite imaging. Any vehicles or weapons (civilian or otherwise) that

CONTACT Vivendi Universal Games
ONLINE www.jointtaskforce.com
PRICE TBA

✓ Looks a treat and is fiendishly difficult.

✗ Another fight-the-terrorists game? Give us a break!

RELEASE DATE: 21 SEPTEMBER 2006



are left around can be used by your troops; capturing an enemy tank and taking it on a rampage through the city is very satisfying.

This is one of the few games that currently support the Ageia PhysX physics engine. The results look excellent, adding to JTF's dynamism.

QUALITY ACCESSORIES FOR
QUALITY ENTERTAINMENT



Def ethics

Oh dear. Hailing from the time-honoured tradition of dated community-awareness-film tragedies (mixed with a pinch of "law abiding is cool" propaganda for children) comes "Don't Copy that Floppy!", an anti-software-piracy advertising campaign straight out of the Hammer-panted '90s. Our story begins with Jenny and Corey, two school students about to copy a computer game. All of a sudden, MC Double Def DP ("That's the *Disk Protector*, for you and the posse") starts dancing around their screen, rapping righteously about the evils of copyright infringement. You can check the vid out at <http://tinyurl.com/8op73>. One wonders what Mr DP would make of the bandwidth-stretching reams of pirated games, music, movies and porn in common torrent files today. Perhaps he'd scat us a little D to the R to the M. Oh, and by the way, Double Def — morality called. It wants its dignity back.

The other "PC"

Ever get the feeling you're being oppressed or maligned by your PC?

Don't laugh — it happens. Some of you may recall the controversy years ago when the County of Los Angeles requested equipment manufacturers refrain from using the terms "master/slave" in relation to hardware communication protocols — on the grounds that it was offensive and discriminatory language. Well, the spectre of political correctness has again reared its head in two recent episodes involving Sony. The company first provoked outrage with the unveiling of a European billboard ad to promote its new white PSP handheld console. The graphic (see right) featured a white model aggressively grasping the face of a black model and the tagline "White is coming". Sony pulled the campaign after the resultant furore and apologised to anyone it had offended. However, Sony has also been called to task by claims that the enemy characters in the PSP's much-hyped new puzzle game, LocoRoco, embody stereotypical racist "blackface" designs. If the company keeps this up much longer, the catchcry "It's a Sony!" will lead to people politely making their excuses before leaving the room.



OF MICE AND MEN

I hope that's a mouse in his hand — and he's not just happy to see me...



Getting a little hand cramp there? Enjoy surprising your co-workers? Or maybe you just like drawing on your leg? Well, as one online reviewer puts it, there's no need to get depressed — because "alternative mouse designs *do exist*". And then some. Meet the V-Mouse, Salient Technology's answer to carpal tunnel syndrome. Designed to be held like a pen, this revolutionary rodent frees the user from the constraints of desktop use — its sensor can work off any non-reflective surface "such as a pillow or a person's lap". A person's lap? Right. This in turn is said to ease fatigue on other body parts. Hmm. Available in wired and wireless (but with no scroll wheel), the V-Mouse has won design awards — and not only because it looks like a vibrator. As Salient asks, "What good is technology... if it does not improve your quality of life?" **APC**



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OPT8966/APC

A close-up, low-angle shot of the front of a silver Toyota Auris. The image focuses on the car's grille, which features the Toyota emblem, and the multi-lens headlights. A black license plate with white text 'BLG 15W' is visible on the left side of the front bumper. The car is parked on a light-colored surface, and the background is a plain, light-colored wall.

[illegible]

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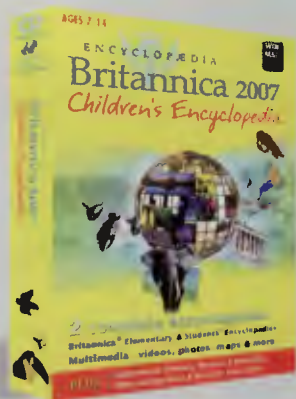
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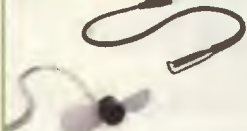
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HP Ink Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
51625A	(#25) \$46.00	\$28.00	C6625A	(#17) \$48.00	\$30.00
51626A	(#26) \$46.00	\$28.00	C6656AA	(#56) \$32.00	\$24.00
51629A	(#29) \$46.00	\$28.00	C6657AA	(#57) \$51.00	\$32.00
51633MA	(#33) \$41.00	\$32.00	C6658AA	(#58) \$37.00	\$26.00
51645A	(#45) \$46.00	\$24.00	C8727A	(#27) \$31.00	\$24.00
51649A	(#49) \$48.00	\$28.00	C8728AA	(#28) \$35.00	\$26.00
C1823D	(#23) \$51.00	\$30.00	C8765WA	(#94) \$31.00	\$27.00
C4841/2/3/4AA	(#10) \$46.00	\$28.00	C8767WA	(#96) \$42.00	\$33.00
C4836/7/8A	(#11) \$48.00	\$18.00	C9363WA	(#97) \$45.00	\$36.00
C5010DA	(#14) \$47.00	\$24.00	C8721WA	(#02) \$28.00	\$16.00
C5011DA	(#14) \$35.00	\$26.00	C8771/2/3WA	(#02) \$16.00	\$11.00
C6578D	(#78) \$51.00	\$30.00	C8774/5WA	(#02) \$16.00	\$11.00
C6614A	(#20) \$44.00	\$24.00	C9351AA	(#21) \$24.00	\$21.00
C6615DA	(#15) \$44.00	\$24.00	C9352AA	(#22) \$27.00	\$23.00

Brother Ink Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
LC-21BK	\$30.00	\$7.90	LC-800BK	\$32.00	\$7.90
LC-21C/M/Y	\$17.00	\$7.50	LC-800C/M/Y	\$18.50	\$7.50
LC-02BK	\$21.00	\$7.90			
LC-02C/M/Y	\$11.00	\$7.50			
LC-04BK	\$28.00	\$7.50			
LC-04C/M/Y	\$16.00	\$7.50			
LC-47BK	\$32.00	\$7.90			
LC-47C/M/Y	\$18.50	\$7.50			



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Lexmark Ink Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
12A1970	\$48.00	\$32.00	10N0016 (#16)	\$46.00	\$36.00
12A1980	\$56.00	\$35.00	10N0026 (#26)	\$49.00	\$39.00
17G0050	\$46.00	\$32.00	15M0120 (#20)	\$53.00	\$41.00
17G0060	\$53.00	\$35.00	18C0031 (#31)	\$43.00	\$35.00
13400HC	\$53.00	\$36.00	18C0034 (#34)	\$43.00	\$35.00
13619HC	\$52.00	\$38.00	18C0035 (#35)	\$45.00	\$37.00
10N0217	\$33.00		18L0032 (#82)	\$47.00	\$39.00
10N0227	\$35.00		18L0042 (#83)	\$53.00	\$41.00

HP Black Toner Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
92298A	\$139.00	\$ 65.00	C8061X	\$165.00	\$ 85.00
C3906A/F	\$ 95.00	\$ 49.00	Q1338A	\$189.00	\$ 95.00
C3903A	\$120.00	\$ 59.00	Q2612A	\$ 95.00	\$ 59.00
C3909A	\$220.00	\$ 95.00	Q2613A	\$ 95.00	\$ 59.00
C4092A	\$ 87.00	\$ 49.00	Q2613X	\$125.00	\$ 69.00
C4096A	\$135.00	\$ 65.00	Q2610A	\$155.00	\$ 75.00
C4127A	\$145.00	\$ 65.00	Q2624A	\$ 96.00	\$ 59.00
C4127X	\$169.00	\$ 80.00	Q5942A	\$190.00	\$ 95.00
C4129X	\$210.00	\$ 95.00	Q5942X	\$279.00	\$125.00
C4182X	\$239.00	\$135.00	Q5949A	\$ 99.00	\$ 59.00
C7115A	\$ 89.00	\$ 49.00	Q5949X	\$169.00	\$ 75.00
C7115X	\$115.00	\$ 65.00	Q6511A	\$169.00	\$105.00

TONNY Colour Toner Cartridges

Printer Model	Model	Genuine	TONNY
HP LJ1500/2500, Canon LBP2410	C9700A (BK)	\$115.00	\$ 65.00
	C9701/2/3A (CYM)	\$135.00	\$ 79.00
HP LJ4600, Canon LBP2460/2040	C9720A (BK)	\$199.00	\$155.00
	C9721/2/3A (CYM)	\$262.00	\$185.00
HP LJ4500	C4191A (BK)	\$119.00	\$ 59.00
	C4192/3/4A (CMY)	\$165.00	\$ 69.00
HP LJ8000	C4149A (BK)	\$150.00	\$ 89.00
	C4150/1/2A (CMY)	\$225.00	\$155.00
Epson C900/1900	S050100 (BK)	\$ 99.00	\$ 79.00
	S050097/98/99 (CMY)	\$210.00	\$119.00
Epson C1000/C2000	S050033 (BK)	\$119.00	\$ 90.00
	S050034/5/6 (CMY)	\$249.00	\$119.00

Samsung Toner

Model	Genuine	TONNY
ML-1210D3	\$ 94.00	\$ 59.00
ML-1650D8	\$185.00	\$105.00
ML-1710D3	\$ 98.00	\$ 59.00
ML-2010	\$103.00	\$ 59.00
ML-2150D8	\$185.00	\$140.00
ML-4100D3	\$ 99.00	\$ 83.00
ML-4500D3	\$119.00	\$ 73.00
ML-6060D6	\$155.00	\$ 93.00
SCX-4216D3	\$ 99.00	\$ 69.00
SCX-5312D6	\$ 95.00	\$ 79.00
SF-5100D3	\$ 89.00	\$ 59.00

Brother Toner Cartridges

Model	Genuine	TONNY
TN-100	\$ 29.00	\$23.00
TN-200	\$ 42.00	\$23.00
TN-2025	\$ 74.00	\$59.00
TN-300	\$ 42.00	\$23.00
TN-3060	\$125.00	\$65.00
TN-8000	\$ 43.00	\$23.00
TN-6600	\$ 99.00	\$65.00
TN-7600	\$125.00	\$65.00

Canon Toner Cartridges

Model	Genuine	TONNY
EP-22	\$ 99.00	\$49.00
EP-25	\$ 99.00	\$49.00
EP-26	\$109.00	\$69.00
EP-32	\$145.00	\$65.00
EP-52	\$185.00	\$80.00
E-31	\$189.00	\$85.00
FX-3	\$132.00	\$59.00
CART-303	\$ 83.00	\$59.00
CART-U	\$ 99.00	\$69.00

Epson Toner Cartridges

Model	Genuine	TONNY
EPL-5700	\$190.00	\$49.00
EPL-5900	\$205.00	\$49.00
EPL-6200	\$215.00	\$49.00

Lexmark Toner Cartridges

Model	Genuine	TONNY
Optra E210	\$129.00	\$59.00
Optra E310	\$225.00	\$69.00
Optra E/E+	\$135.00	\$59.00
X215	\$105.00	\$59.00

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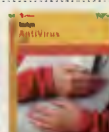
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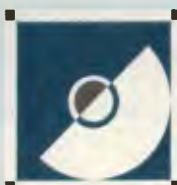
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T028/T029	\$ 8.00/\$10.00	T0540-T0549	\$ 7.50 ea
T038/T039	\$ 8.00/\$10.00	T0621(High Cap)	\$ 8.50
T0321-T0424	\$ 7.50 ea	T0631-T0634	\$ 7.50 ea
T0461-T0474	\$ 7.50 ea	T-5591-T-5596	\$ 9.00 ea
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C8728A (#28)	\$ 28.00	C9396A-C9393A	(#88) \$32.00/\$24.00
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HP/Lexmark	- Black, Cyan Magenta, Yellow
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HP/Canon Black Toner Cartridges-Rem:

HP-92274A / Canon-EPP	\$ 55.00	HP-Q2624A	\$ 55.00
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HP-C4129X / Canon-NP-62	\$ 90.00	Canon-FX-4	\$ 60.00
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HP-C7115X / Canon-EP-25	\$ 60.00	Canon-FX-9	\$ 75.00
HP-C8061X	\$ 83.00	Canon-Cart N	\$110.00
HP-Q2612A/Q2613A	\$ 55.00	Canon-Cart W	\$100.00
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Brother Black Toner Cartridges-Rem:

TN-2025	\$ 55.00	TN-3060 High	\$ 63.00
TN-6600 High capacity	\$ 63.00	TN-7600 High	\$ 63.00
TN-8000	\$ 22.00	DR3000 (Drum)	\$105.00
DR6000/DR7000 (Drum)	\$105.00	DR8000 (Drum)	\$120.00

Samsung Black Toner Cartridges-Rem:

ML-1210D	\$ 65.00	ML-1610D/2010D	\$ 75.00
ML-1710D	\$ 65.00	SCX-4216	\$ 65.00
ML-4500D	\$ 75.00	SF-5100D	\$ 65.00

Colour Toner Cartridges-Rem:

HP 3500	(Q2670A-Q2673A)	\$135.00 ea
HP 2550	(Q3960A-Q3963A)	\$100/\$110 ea
HP 8500/8550	(C4149A-C4152A)	\$ 90/\$150 ea
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HP 2500/LBP-2410	(C9700A-C9703A)/EP-87	\$ 80/\$95 ea
HP 4600/4650	(C9720A-C9723A)	\$150/\$180 ea
Epson C900/C1900	(S050100/97/98/99)	\$ 95/\$115 ea
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Samsung	CLP-500B/C/M/Y	\$120 ea

Lexmark Bk Toner Cartridges-Rem:

X215	1850090	\$ 65.00
E210	1050063	\$ 65.00
Optra E	69G8256	\$ 55.00

Epson Black Toner Cartridges-Rem:

EPL-5700/5700L	S050010	\$ 75.00
EPL-5900/5900L/6100	S050087	\$ 75.00
Drum (EPL-5700/5900/6100)	S051055	\$ 95.00
EPL-6200	S050166	\$ 75.00

Panasonic Black Toner Cartridges-Rem:

UG-3204	UF-745/755/755E/775E	\$110.00
UG-3309	UF-744/788	\$140.00
UG-3313	UF-550/560/585/770/880/DX1000	\$110.00
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RRP **\$39.00**



TL-WN620G

108M Wireless USB Adapter with Super G™, 2.4GHz, 802.11 g/b.

RRP **\$49.00**



TL-WN651G

108M Wireless PCI Adapter with eXtended Range™ and Super G™, Atheros, 2.4GHz, 802.11 g/b, detachable Antenna.

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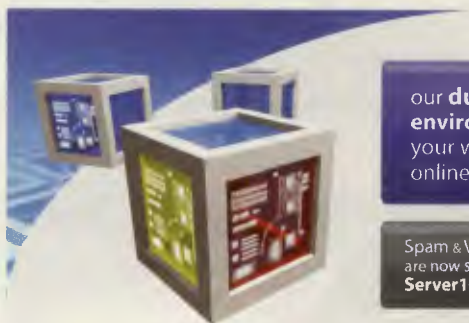
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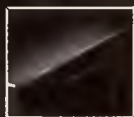
Aguila

Thermaltake's latest range of Mid Tower cases

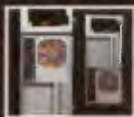
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Aguila



Stylish aluminium front panel design that open both sides.



ATX and BTX compatible (BTX upgrade kit is optional)

MATRIX



MATRIX



Mesh design front panel for maximum ventilation



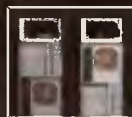
CPU air guide and VGA card venting hole



ATTACH



Stylish aluminium front panel design with meshed grill for maximum ventilation



ATX and BTX compatible (BTX upgrade kit is optional)

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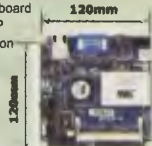
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- VIA 10/100 LAN
- VIA TV Out (HDTV)
- LVDS/DVI (optional)
- Nano-ITX (120mm x 120mm)
- Digital Media and Mobile Entertainment



Model: EPIA-N



- All in One
- VIA C7™/Eden™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPEG-2 acceleration
- DDRII 400/533
- 1 PCI slot
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 6 USB 2.0 ports
- 2 COM ports
- GLAN Controller
- TV Out (HDTV)
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Digital Media, Entertainment, Set Top Box

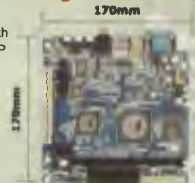


Model: EPIA - EN



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- DDRII 400/533
- 1 PCI slot
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- 1 COM port
- 10/100 LAN
- TV Out
- Mini-ITX (170mm x 170mm)
- KIOSK, Thin Client



Model: EPIA - CN



- All in One
- VIA C3™/Eden™ Processor onboard with Integrated UniChrome AGP graphics w/MPEG-2 Acceleration
- DDR 266
- CardBus/CompactFlash Support
- 1 PCI slot, 1 Floppy Connector
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 4 USB 2.0 ports
- 2 COM ports
- VIA 10/100 LAN
- TV Out
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Wireless Media, Kiosk, Set Top Box



Model: EPIA - MII



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- DDR 266
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- Vinyl 6 channel Audio
- 4 USB 2.0 ports
- VIA 10/100 LAN
- TV Out (optional)
- Mini-ITX (170mm x 170mm)
- Low-power and affordable embedded devices



Model: EPIA - ML



Digital Media and Entertainment

- All in One
- VIA C3™/Eden™ with Processor onboard Integrated UniChrome AGP graphics w/MPEG-2 Acceleration
- DDR 266
- 1 PCI slot, 1 Floppy Connector
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 4 USB 2.0 ports
- VIA 10/100 LAN
- TV Out
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Digital Media and Entertainment



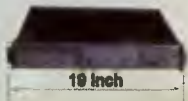
Model: EPIA - M



19" Mini-ITX Rackmount

Model No.: 7677

- 19" 1U Rackmount
- Internal 3.5HDD x 1
- PCI Expansion Slot x 2
- Slim Type CD / DVD x 1
- 45(H) x 484(W) x 400(D)
- Cooling: 2 x 40mm fans
- Power and HDD indicators
- Mini-ITX (170mm x 170mm)
- Power on/off



19 inch

Firewall/VPN/Telephony/Telecom/VoIP Network/Security/Military Application

Model No.: C1B

- 19" 1U Rackmount
- Internal 3.5" HDD x 1
- Internal 2.5" HDD x 1
- PCI Expansion Slot x 1
- Slim CD-rom/DVD-rom x 1
- 19"(W) x 13"(D) x 1.75"(H)
- Mini-ITX (170mm x 170mm)
- Cooling: 2 x 40x28mm fans
- Power on/off and system reset
- Power, LAN and HDD indicators



Firewall/VPN/Telephony/Telecom/VoIP Network/Security/Military Application

Model No.: C1E

- 19" 1U Rackmount
- Internal 3.5" HDD x 2
- PCI Expansion Slot x 1
- Slim CD-rom/DVD-rom x 1
- 19"(W) x 14.5"(D) x 1.75"(H)
- Front access USB & LAN ports
- Power LAN and HDD indicators
- Up to 12" x 9.8" ATX size mobo
- Power on/off and system reset
- Cooling: 1 x 97mm blower or 2 x 40x56mm fans



World's Smallest Case

Model No.: 1677

- Color: Black
- Front Port: USB x 2
- Internal 2.5" HDD x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Nano-ITX (120mm x 120mm)
- Power on/off and system reset
- 82.5mm(H) x 160mm(W) x 163mm(D)



Home Media Center, Set Top Box, Kiosk, Wireless Media

Model No.: 2677

- Color: Black
- Expansion Slot x 1
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 63.5mm(H) x 295mm(W) x 272mm(D)



Home Media Center, Set Top Box, Kiosk, Wireless Media

Model No.: 2600

- Color: Black
- Expansion Slot x 1
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- Slim Type CD / DVD x 1
- 63.5(H) x 295(W) x 272(D)
- Mini ITX (170mm x 170mm)
- 60W/80W Power Adaptor
- Power on/off and System Reset
- USB x 2, Audio x 1, Mic x 1, 1394 x 1, IR Module (Optional)



Set Top Box, Thin Client, Car Entertainment, Smart Mini PC

Model No.: 3677

- Front Port: USB x 2
- Internal 2.5" HDD x 1
- 6cm Cooling Fan x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 65mm(H) x 210mm(W) x 275mm(D)



Set Top Box, Thin Client, Car Entertainment, Smart Mini PC

Model No.: 3688

- Front Port: USB x 2
- Internal 2.5" HDD x 1
- 6cm Cooling Fan x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 65mm(H) x 210mm(W) x 258mm(D)



Stylish Cube Entertainment centers

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- 4cm Cooling Fan x 2
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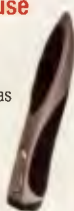


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3139-1	CGA To VGA Converter - Converts a 15k CGA signal to standard VGA	\$299
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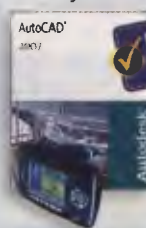


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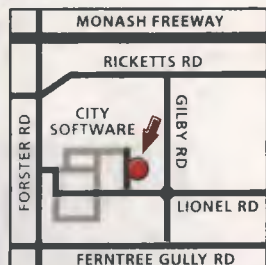
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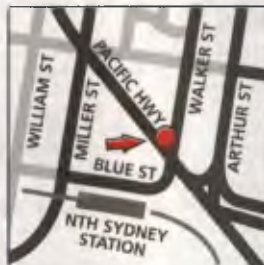


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1 Year Warranty

Series:	nx6320 Notebook PC	nx9420 Notebook PC
Manufacturer #:	RA762PA	EX763PA
Processor:	Intel Centrino DUO (T2400 - 1.83Ghz)	Intel Centrino DUO (T2500 - 2Ghz)
Memory (Ram):	1 x 512MB, 533MHz	1 x 1GB, 667MHz
Video Card:	Intel GMA950	256MB ATI Mobility Radeon X1600
Hard Drive:	60GB 5400RPM	100GB 5400RPM
Optical Storage:	Dual Layer DVD+/-RW	Dual Layer DVD+/-RW
Display:	15.0" XGA (1024 x 768) TFT	17" WSXGA+ (1680 x 1050) TFT
Modem/Ethernet:	56K V.92, 10/100/1000 NIC, WLAN, BT	56K V.92, 10/100/1000 NIC, WLAN, BT
Pointing Device:	Touchpad	Integrated numeric keypad, Touchpad
Operating System:	Microsoft Windows XP Pro	Microsoft Windows XP Pro

Our Price \$2147 Save \$52
WebCode.....HCN0055

Our Price \$3387 Save \$112
WebCode.....HCN0053



HP NX9420 notebook displayed

1 Year Warranty

TFT Screen Clean

For use on all coated and non-coated Laptop, Notebook, TFT, Plasma, LCD, PDA, GPS, Mobile, basically any Screen or Monitor. Extensively tested by Users and Manufacturers, Laboratory and Industry test have shown that Cleansafe will clean and protect all screen surfaces.



Our Price \$18 Save \$4
WebCode.....CLE0001

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 5 Year Warranty

Belkin Vertical Slip Case For Notebooks

The NE-SC2 Vertical Slip Case by Belkin provides convenient, portable storage for the traveling notebook user. In addition to its lightweight design, the NE-SC2 features stow-away handles and non-slip sides for secure transport. Its top-loading convenience makes it easy to access the notebook section. Among our many mobile-office designs and features, you'll find the perfect fit for the way you work. Also available in Red & Beige



Our Price **\$33** Save **\$6**
WebCode: BEL2896

Maxtor OneTouch Mini Portable 40GB External HDD

- Ideal storage and backup solution for people on the go
- USB 2.0 and 1.1
- Maxtor OneTouch button - the easy way to make backup copies of your files
- Quick and easy installation
- Plug and play storage



Our Price **\$139** Save **\$10**
WebCode: MAX0088

Excel DVD-R 8X 50pc Spindle

The ideal choice for high resolution video and images. Create, edit and archive home movies & digital photos while storing and accessing data from one disc. DVD-R discs capture 4.7GB. Printable surface.



Our Price **\$19** Save **\$16**
WebCode: EXC0005

Series:	K1 Express Dual Series (Notebooks)	M1 Express Dual Series
Manufacturer #:	K1-2224MA	M1-G3C3A
Processor:	Intel Pentium M Processor 1.73GHz (740)	Intel Core Duo Processor T2400 1.83GHz
Memory (Ram):	512MB 533MHz DDR2	512MB DDR2 667MHz (max. 4GB)
Video Card:	Intel GMA 900	NVIDIA GeForce Go 7400
Hard Drive:	60GB	80GB 5400rpm SATA
Optical Storage:	DVD Super-Multi Dual Layer	DVD+-RW, DVD-Ram Super-Multi Dual Layer
Display	15" XGA (1024 x 768)	15.4" XGA 1024 x 768
Modem/Ethernet	56K modem, 10/100/ Wireless	56K/V.92 modem, 802.11a/b/g
Operating System	Microsoft Windows XP Professional	Microsoft Windows XP Pro

Our Price **\$1326** Save **\$173** Our Price **\$1963** Save **\$135**
WebCode: LGE0071 WebCode: LEG0086



M1 - 52A6A model displayed

1 Year Warranty

Series:	S1 Express Dual Series
Manufacturer #:	S1-J2C3A
Processor:	Intel Core Duo M Processor 1.83GHz
Memory (Ram):	1GB 667MHz DDR2
Video Card:	ATI Mobility Radeon X 1400
Hard Drive:	80GB
Optical Storage:	DVD+-RW, DVD-Ram Super-Multi Dual Layer
Display	15" WXGA (1280 x 800)
Modem/Ethernet	56K Modem, 802.11a/b/g
Operating System	Microsoft Windows XP Professional

Our Price **\$2258** Save **\$91**
WebCode: LGE0087



S1-J3A2A model displayed

1 Year Warranty

LG 19" Standard LCD Monitor (L1919SSF)

- Brightness : 300 cd/m2
- Viewing Angle : H: 160, V: 160,
- Contrast Ratio : 1400 : 1
- Response Time : 8ms
- Resolution : 1280 x 1024



Our Price **\$358** Save **\$193**
WebCode: LGE0081

Series:	S53V43	R55V15
Manufacturer #:	98.K4511.V43	9H.01501.V15
Processor:	Intel Pentium M 745 1.8GHz	Intel Centrino Core Duo processor T2400
Memory (Ram):	512MB DDR2 533MHz (max. 2GB)	512MB DDR2 533MHz (max. 2GB)
Video Card:	Intel GMA 900 - DVM Technology	NVIDIA GeForce Go 7400 TurboCache
Hard Drive:	60GB (5400RPM)	80GB 5400rpm SATA
Optical Storage:	8X DVD-Dual (Support Double Layer)	8X DVD-Dual (Support Double Layer)
Display	13" WXGA (1280 x 768)	15.4" WXGA 1280 x 800
Modem/Ethernet	56K/V.92 modem, Built-in 802.11b/g	56K/V.92 modem, 802.11 a/b/g Wireless
Operating System	Microsoft Windows XP Home	Microsoft Windows XP Pro

Our Price **\$1177** Save **\$122** Our Price **\$1987** Save **\$112**
WebCode: BEN0006 WebCode: BEN7506



BenQ R55V15 model displayed

BenQ FP91G+ 19" LCD Monitor

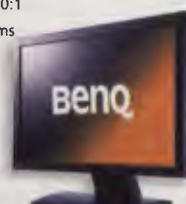
- Brightness: 250cd/m2
- Viewing Angle: 140/135
- Contrast Ratio: 550:1
- Response Time: 8ms
- Resolution: 1280 x 1024
- Connection: VGA & DVI



Our Price **\$359** Save **\$40**
WebCode: BEN1057

BenQ FP202W 20" LCD Monitor

- Brightness: 300cd/m2
- Viewing Angle: 140/130
- Contrast Ratio: 600:1
- Response Time: 8ms
- Resolution: 1680 x 1050
- Connection: VGA and DVI



Our Price **\$538** Save **\$361**
WebCode: BEN1063

BenQ FP241W 24" LCD Monitor

- Brightness: 500cd/m2
- Viewing Angle: 178/178
- Contrast Ratio: 1000:1
- Response Time: 6ms (GTG)
- Resolution: 1920 x 1200
- Connection: D-Sub/DVI-D/5-Video/Composite/Component/HDMI



Our Price **\$1645** Save **\$154**
WebCode: BEN0006

See page 2 for details

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Acer 19" LCD Monitor AL1916S

- Brightness : 250cd/m2
- Contrast Ratio : 500 : 1
- View Angle : 140 / 140 (H/V)
- Response Time : 8 ms
- Resolution : 1280 x 1024



Our Price **\$352** Save **\$327**
WebCode.....ACM0059

Acer 24" LCD Monitor AC2416WD

- Brightness : 500cd/m2
- Contrast Ratio : 1000 : 1
- View Angle : 178 / 178 (H/V)
- Response Time : 6 ms
- Resolution : 1920 x 1200



Our Price **\$1268** Save **\$231**
WebCode.....ACE0055

Acer 37" LCD TV AT3704 94 cm

- Resolution 1366 x 768
- Brightness (typ.) 500 nits
- Contrast Ratio (typ.) 1000:1
- Viewing Angle (typ.) H:176° ; V:176°
- Response Time (typ.) 8 ms (Gray to Gray)
- Display color 16.7M



Our Price **\$2236** Save **\$363**
WebCode.....ACE0054

Acer Altos G320 Server

- Intel Pentium 4 630 with HT Technology (3.0GHz 2MB L2 cache 800MHz FSB)
- 1GB DDR2-533 MHz ECC REG (Max 4GB)
- 160GB SATA HDD 7200RPM
- 16X DVD-ROM drive
- Integrated Dual 10/100/1000 Ethernet controller
- Integrated Four port SATA controller with RAID 0,1
- 3 x PCI-Express, 2 x PCI slots
- ATI RN50 16 MB SDRAM graphics controller
- 3.5" 1.44MB FDD, Media Bay for optical and Tape Backup
- 2 x PS/2 ports, 1 x Serial port, 4 x USB 2.0 ports
- AIT-1 Turbo 40/100GB Internal IDE tape drive
- Microsoft Small Business Server 2003 Standard Edition - 5 CALS (pre-loaded)

**3 year parts & labour,
next business day onsite**



Our Price **\$2372** Save **\$178**
WebCode.....ACE0061

Series:	Acer Power F5	Acer Power F5
Manufacturer #:	AP.F5AB2.190GE-B19	AP.F5AB2.210GE-B19
Processor:	Celeron D336 2.8GHz	Intel Pentium 4 3.06GHz
Memory (Ram):	512MB DDRII DDR533	1024MB DDRII-SD RAM 533MHz
Video Card:	Integrated ATI Radeon Xpress 200 graphics	ATI Radeon Xpress 200
Hard Drive:	80GB 7200RPM SATA II	160GB S-ATA 7200RPM
Optical Storage:	DVD/CDRW Combo drive	16x Dual Layer DVD Burner
Modem/Ethernet	Gigabit Ethernet	Gigabit Ethernet
Operating System	Microsoft Windows XP Home	Microsoft Windows XP Home
Warranty:	3 Years Onsite	3 Years Onsite

Our Price **\$768** Save **\$71** Our Price **\$1027** Save **\$132**
WebCode.....ACE0058 WebCode.....ACE0059



Image used for illustration purposes only

Series:	Acer TravelMate 4223WLMi-Pro	Acer TravelMate 5612WSMi
Processor:	Intel Duo Core T2400 1.83GHz	Intel Core Duo T2300 1.66GHz
Memory (Ram):	1GB PC4200 DDR-SDRAM	512MB DDR2-SDRAM
Video Card:	ATI Radeon X1300 with 256MB	GeForce Go 7300
Hard Drive:	100G 5400rpm HDD	60GB HDD
Optical Storage:	DVD Dual Layer	DVD Super Multi Dual Layer
Display	15.4" TFT WideScreen	17" WXGA Widescreen TFT
Modem/Ethernet	56K Modem & 10/100/1000 Lan	56Kbps Modem, 10/100/1000 LAN
Operating System	Microsoft Windows XP Pro	Microsoft Windows XP Pro
Warranty	1 Year Onsite	1 Year Onsite

Our Price **\$1897** Save **\$202** Our Price **\$1943** Save **\$56**
WebCode.....ACE0060 WebCode.....ACE0052



**Free
Carry Bag**

Image used for illustration purposes only

Wireless Presentation Gateway

The WP100 connects directly to existing projectors and enable PCs with WLAN, to wirelessly project screen images of applications running on PC and play audio files. The impressive Wireless Presentation Gateway enables mobility, productivity and efficiency through Ease of use in a conference room.



Our Price **\$325** Save **\$50**
WebCode.....ACE0069

Acer PD323 Projector

- Projection System: DLP technology
- Resolution: Max SXGA (1280 x 1024)
- Aspect Ratio: 4:3 (native), 16:9
- Brightness: 1600 ANSI Lumens
- Contrast Ratio: 2000:1
- Projection Screen 27.7" to 302"
- Lamp Life: 2,000 hours
- Weight: 1.3 Kg.



Our Price **\$2538** Save **\$461**
WebCode.....ACE0057

Acer PD523PD Projector

- Projection System: DLP technology
- Resolution: Native: XGA (1,024 x 768) Maximum: SXGA (1,280 x 1,024)
- Aspect Ratio: 4:3 (native), 16:9
- Brightness: 2,400 ANSI Lumens
- Contrast Ratio: 2000:1
- Projection Screen Size: 24.7" to 300"
- Lamp Life: 3,000 hrs (ECO)
- Weight: 2.7 Kg



Our Price **\$1725** Save **\$274**
WebCode.....ACE0056

Computer Systems

Buying the latest IT hardware?
Why not extend your warranty!
See page 2 for details!

**UP TO
5 Year
Warranty**

Blueant X3 Micro Bluetooth Headset

The award winning X3 micro Bluetooth headset is one of the smallest and best performing headsets available in the world. Lightweight, stylish and comfortable, the X3 micro is the ultimate Bluetooth accessory for people on the move. The X3 micro can be paired to 3 different Bluetooth devices and comes with multiple charging options including USB, wall and in car chargers.



Our Price **\$97** Save **\$32**
WebCode.....BLU0008

Blueant EzyTalk Bluetooth Handsfree Car Kit

The totally wireless EzyTalk Bluetooth plug and go handsfree car kit offers both excellent sound quality and zero installation costs. The microphone and speaker are integrated in a stylish and compact design with a DSP (Digital Sound Processor) to minimise echo effect and background noise. The EzyTalk is powered by the vehicle lighter socket.



Our Price **\$118** Save **\$21**
WebCode.....BLU0009

Blueant Supertooth II Bluetooth Speakerphone

This speakerphone provides the user with exceptional sound quality via totally wireless Bluetooth technology. Mounted on a magnetic clip attached to the vehicle sun visor, the Supertooth II is the ideal Bluetooth handsfree solution requiring zero installation costs, as well as the ability to change vehicles quickly and easily.



Our Price **\$159** Save **\$40**
WebCode.....BLU0007

HP Ipaq RX1950 Live life with greater mobility and freedom

- Featuring Microsoft Windows for a familiar and intuitive environment
- Incredibly sleek yet amazingly powerful, the Pocket PC slips into your pocket and slides into your smallest bag with ease
- Get ready for the next generation technology with revolutionary Microsoft Windows Mobile Version 5.0.
- Free yourself with wireless connectivity for high-speed data connectivity at home, at work and on the go
- Take your music and video with you wherever you go with the latest Windows Media Player
- Supporting WMA, MP3 and WMV formats you carry your music and video at all times



Our Price **\$379** Save **\$20**
WebCode.....COQ0127

I-Mate Jasjar Pocket Pc Smartphone

Now you can stay in contact with the office and friends wherever you go thanks to the i-mate JASJAR. The Tri-band i-mate JASJAR features 3G connectivity and will automatically transfer to the best network mode high quality media content as well as pictures can be downloaded and viewed on the stunning VGA colour display, which can be swivelled 180 degrees.

Bluetooth and Wifi have been included along with a QWERTY keyboard and a 1.3 Megapixel camera.

Windows Mobile 5 Phone Edition is provided on the i-mate JASJAR and this provides the latest features and applications Push e-mail, Permanent memory storage,



Our Price **\$1550** Save **\$149**
WebCode.....MAT1003

Acer D150 Portable Satellite Navigation System

Enjoy your travels with the d150 GPS system from Acer. From the intuitive touch-screen and CoPilot navigation software, to the voice-assisted directions and safety camera alerts, no matter what your destination, you can let the Acer d150 take you there.

Dynamic Route Guidance
The Acer d150 provides spoken turn-by-turn directions, including automatic route recalculations within seconds of a diversion.



Our Price **\$499** Save **\$100**
WebCode.....ACE0064

Eten G500 Smartphone with GPS

Combining PDA, Phone, GPS, Camera and Digital Entertainment functions all in a single pocket sized device, The Eten G500 represents the most integrated and highly refined solution to meet the needs of business professionals and frequent road travellers.

- Fully integrated GPS capabilities
- Embedded with royalTek GPS module with SIRF Star III chipset
- Samsung 400MHz processor
- 128Mb of flash rom & 64Mb SDRAM memory
- Microsoft Windows Mobile 5.0 software
- 2.8" Touch Screen Display
- GSM quad-band 850/900/1800/1900 MHz
- GPRS class B
- Bluetooth v2 Connectivity
- Mini-SD card slot supported
- Built in 1.3 mega pixels camera



Our Price **\$996** Save **\$203**
WebCode.....ETE0003

Palm Tungsten E2 Bundle

Wherever your life is going, this is the perfect handheld to take along for the ride. The sleek, stylishly designed Tungsten E2 handheld from palmOne. With a brighter, richer colour screen, it brings your calendar, contacts, documents and presentations, photos and videos to life. Just as important, its flash memory keeps all that information safe even if you don't have time to recharge. There's even built-in Bluetooth technology for wireless connectivity. Taking work to go? View and even edit spreadsheets and word processing documents right on your handheld. Easily sync your calendar and contacts from Outlook. And grab your MP3 tunes too You're going places.



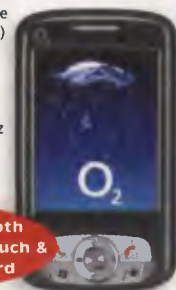
Includes
Leather Case, Stylus Pack &
Screen Protectors

Our Price **\$339** Save **\$40**
WebCode.....USR1043

O2 XDA Atom Executive Bundle

A vital tool for professionals on the move, this slim PDA-phone is loaded with a faster processor, more memory, Personal Information Management (PIM) applications and handy tools to keep you on the fast lane in the competitive business world.

- Email anytime, anywhere via MS Outlook Mobile with Direct to Push Technology
- Think faster with Intel XScale PXA 27x 520MHz
- Enjoy instant online access with Wireless LAN
- New Microsoft Windows Mobile 5.0
- 2.0 Mega Pixel Camera with Strobe Flash



Includes Bluetooth
Headset, Leather Pouch &
Infrared Keyboard

Our Price **\$1093** Save **\$136**
WebCode.....XDA0910

TomTom Go 710 Portable Navigation

- Easy to use:** Extra wide 4" LCD touchscreen gives you smart design and easy to use navigation literally at your fingertips
- SD Card Containing Maps of Australia:** Navigate Australia door-to-door
- Extra wide LCD screen:** 4 inch high quality LCD screen with crystal-clear 3D graphics
- Clear spoken instructions:** Speaks some 36 languages in over 50 different voices
- Hands-free calling:** Doubles as a hands-free car kit using Bluetooth technology. So you can make & receive calls as you drive with just a touch of the screen
- Smart extras:** iPod control, home dock and much more besides



Our Price **\$927** Save **\$42**
WebCode.....TOM0003

Navman iCN720 Satellite Navigation

The Navman iCN 720 is ready to use straight out of the box, so you discover this revolutionary way to use GPS navigation immediately. As well as being fully portable, so you can transfer your Navman GPS navigation between vehicles quickly and easily, the iCN 720 provides:

- Integrated NavPix software and camera so you can create your own location-referenced POI images
- 4" state of the art wide high-definition TFT touchscreen
- Latest GPS navigation software using SIRFstarIII Generation 2 technology
- 3D door-to-door navigation using pre-loaded software
- Voice-guided, road specific directions
- Fuel and Park buttons to identify the nearest fuel or parking location



Our Price **\$1047** Save **\$52**
WebCode.....NAV0012

See page 2
for
details!

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Visit www.csw.com.au/maxtor to view our full range of Maxtor Drives!

Maxtor OneTouch Mini Portable External HDD

- Ideal storage and backup solution for people on the go
- USB 2.0 and 1.1
- Maxtor OneTouch button - the easy way to make backup copies of your files
- Quick and easy installation
- Plug and play storage

2.5 Portable Solution



40 GB	80 GB	160 GB
Our Price \$139 Save \$10	Our Price \$189 Save \$10	Our Price \$289 Save \$10
WebCode MAX0088	WebCode MAX0083	WebCode MAX0084

Maxtor OneTouch III

- Simple Maxtor user-interface for drive management, security and backup scheduling
- System Rollback - rolls your system state back to a better point in time while keeping data current
- Sync automatic synchronization of data
- Maxtor OneTouch button - the easy way to make backup copies of your files
- Plug and play storage
- Quick and easy installation



200 GB	300 GB	400 GB
Our Price \$239 Save \$10	Our Price \$289 Save \$10	Our Price \$478 Save \$16
WebCode MXT0200	WebCode MXT0201	WebCode MAX0082

Maxtor OneTouch III Turbo

- User-configurable RAID 0 and RAID 1
- FireWire 800 FireWire 400 USB 2.0 and 1.1
- PC and Mac compatible
- Maxtor OneTouch button - backup
- Maxtor DriveLock protects contents of drive if lost or stolen
- Cool operation and modular design for easy stacking
- Plug and play storage
- Creates historical backup versions with comprehensive system and data restore to a point in time

1 Terabyte



800 GB	1 TB
Our Price \$675 Save \$24	Our Price \$997 Save \$102
WebCode MXT0252	WebCode MXT0351

Maxtor Shared Storage Plus & Maxtor Shared Storage II 1TB

- Store and automatically backup the data on networked computers to one location for MAC and PC
- Up to 1TB capacity with simple user Interface RAID 1 and 0
- Schedule backup to external hard drives for added data protection, off-site data backup rotation
- 2 USB ports for connecting and sharing printers and additional hard drives
- 10/100/1000 Gigabit Ethernet RJ-45 port connection
- Media server plays back digital photos, music and video to networked media/entertainment systems without a computer having to be on
- Access files from any networked PC, Mac or compatible networked media/entertainment system



MSS Plus 300 GB	MSS Plus 500 GB	MSS II 1TB
Our Price \$376 Save \$23	Our Price \$529 Save \$20	Our Price \$1170 Save \$29
WebCode MAX0071	WebCode MXT0104	WebCode MXT0350

Maxtor Basic USB Hard Drive

Easy add-on storage for home or office. Instantly expand your storage to hold your digital photos, music, and data files. PC compatible.

- Easy add-on storage for home or office
- Easy installation
- Perfect for digital photos, music, and data files
- Compact design includes stand for vertical orientation
- USB 2.0 and 1.1 compatibility
- Up to 500GB capacities
- PC compatible



160GB	200GB	300GB	500GB
Our Price \$169 Save \$10	Our Price \$184 Save \$10	Our Price \$235 Save \$14	Our Price \$412 Save \$37
WebCode MXT0209	WebCode MXT0204	WebCode MXT0205	WebCode MXT0208

Maxtor SATA Hard Drives

- Designed for mainstream PC, consumer electronics and emerging markets
- 80, 120, 250 & 300GB capacities
- 7200 RPM
- SATA interfaces
- 2MB or 8MB cache buffer
- Fluid dynamic bearing motors for quiet operation



80GB
Our Price \$99 Save \$30
WebCode MAX0054

Maxtor Hard Drive 80GB ATA-133 7200RPM 8MB Cache

The solution for performance PCs with data intensive applications such as network attached storage, home networking devices, audio, video and other multimedia applications.



Our Price \$90 Save \$19
WebCode MXT0051

Maxtor 300GB IDE Hard Drive

Capacities up to 300GB, dual processor technology and larger buffers for faster boot times, file transfers and performance that handles multiple applications with ease. These high performance 7200RPM drives are designed for multimedia PC users, system integrators and white-box builders.



Our Price \$191 Save \$38
WebCode MXT0126

Storage - Hard Drives

Buying the latest IT Hardware?
Why not extend your warranty!
See page 2 for details!

UP TO
3 Year
Warranty

KVM'S

Comsol USB 2.0 flashIT2 Flash Drive

These pocket USB 2.0 flashIT2 Storage Drives plug directly into any standard USB port and are compatible with both PC and Macs.

512MB (COM0107) **\$39**
2GB (COM0109) **\$110**
4GB (COM9162) **\$220**



1GB
Our Price **\$65** Save **\$10**
WebCode.....COM0108

Comsol USB VoIP Phone

Used in conjunction with Skype or similar software, the Comsol USB VoIP Phone offers you a complete free Internet telephony solution.

- SKYPE ready – talk for free with other Skype users
- Works with most leading VoIP providers
- Make huge savings on local, STD and international calls
- A-Tick



Our Price **\$45** Save **\$34**
WebCode.....COM0101

Comsol USB 2.0 Desktop Hubs

- Hi-Speed USB 2.0 Certified
- Blue LED to indicate power status
- Stylish aluminium casing
- Supports Plug & Play and Hot-Swapping
- Data transfer speeds up to 480Mbps
- No software required for easy installation

7 Port Hub (COM0117) **\$49**



4 Port
Our Price **\$32** Save **\$13**
WebCode.....COM0116

Comsol ServerLink Altitude KVM USB & PS/2

The ServerLink Altitude offers a 19" rackmountable solution with PS/2 & USB support for your server and console. With its independent cascade port, multiple units can be daisy-chained up to 16 levels without losing any ports. Its fully featured, menu driven OSD offers more intuitive and convenient control.

Features include:

- USB and PS/2 interface support on both console and server side
- Direct channel selection and operation using front-panel push buttons and keyboard hotkeys
- Password protection for added security
- Independent cascade port
- 15 pin high density connectors for simple cable management
- Robust and durable in metal enclosure
- Cascadable to control up to 256 servers

USB and PS/2 Compatible



Our Price **\$447** Save **\$52**
WebCode.....COM9154

Our Price **\$687** Save **\$62**
WebCode.....COM9155

Comsol ServerLink Dual KVM USB & PS/2

The ServerLink Dual series of KVM switches provide a simple yet cost effective solution to control up to 4 multi-platform computers. Offering support for PS/2 and USB. It allows you to access, control, boot and reboot multiple USB-enabled multimedia computers using the one keyboard, monitor, mouse and a set of speakers and microphone.

Features include:

- Desktop USB PS/2 KVM switch with audio and microphone switching
- PS/2 & USB Keyboard and mouse support
- Built-in 2 or 4port USB hub for sharing USB devices
- High resolution video up to 2048 x 1536
- Independent, simultaneous USB hub port and PC port selection

4 Port Dual (COM9153) **\$217**

USB and PS/2 Compatible



Our Price **\$156** Save **\$23**
WebCode.....COM9152

Comsol MicroFlash2

The Comsol MicroFlash2 USB 2.0 storagedrives are the perfect choice for portable storage where size matters. Compact and lightweight, they fit on a key ring or just pop them in your pocket.

Features include:

- Full compliance with USB 2.0 Specifications
- Compact and durable design
- Only 46mm long and 17mm wide
- Driverless under Windows ME/2000/XP and OS X

512MB (COM9159) **\$35**
1GB (COM9160) **\$59**
2GB (COM9161) **\$102**



256MB
Our Price **\$27** Save **\$10**
WebCode.....COM9158

Comsol ServerLink 15" LCD KVM Rack Drawers

These 1U console drawers combine a KVM, 15" TFT LCD, mouse & keyboard all in a standard 19" 1U drawer. Combining dual functionality of both PS/2 and USB connections, these multi-platform KVMs are designed to readily integrate into your existing network infrastructure.

8 Port (SER0005) **\$2540**
16 Port (SER0006) **\$2925**



Single Port
Our Price **\$1915** Save **\$84**
WebCode.....COM7510

Comsol ServerLink 17" LCD KVM Rack Drawers

These 1U console drawers combine a KVM, 17" TFT LCD, mouse & keyboard all in a standard 19" 1U drawer. Combining dual functionality of both PS/2 and USB connections, these multi-platform KVMs are designed to readily integrate into your existing network infrastructure.

8 Port (SER0007) **\$2699**
16 Port (SER0008) **\$3199**



Single Port
Our Price **\$2199** Save **\$100**
WebCode.....COM7605

Comsol ServerLink Elite KVM

Using high-density connections, and taking only 1U of rack space makes the ServerLink Elite 8 and 16 Port KVMs ideal for any server room where space is at a premium.

16 Port PS2/VGA inc. cables (SER0003) **\$695**



8 Port PS2/VGA inc. cables
Our Price **\$555** Save **\$44**
WebCode.....COM0085

Comsol ServerLink Star 2 Port KVM Switches

Control 2 PCs with a single keyboard, monitor & mouse. All ServerLink Star KVM switches have audio and microphone support for multimedia applications. Available in PS/2 only, USB only and PS/2 & USB Combo.

2 Port PS/2 & USB (COM0077) **\$76**
2 Port USB (COM0076) **\$79**



2 Port PS/2
Our Price **\$69** Save **\$10**
WebCode.....COM0075

Comsol ServerLink Slim KVM Switches

With its slim size and ease of operation, it is an indispensable device for managing multiple PCs on your SOHO or Corporate desktop. Its compact and lightweight design fits comfortably anywhere on your desktop. Available in 2 or 4 port models. Both models include cables.

4 Port inc. cables (COM0095) **\$175**



2 Port inc. cables
Our Price **\$89** Save **\$10**
WebCode.....COM0094

Comsol ServerLink IP Remote Access Device

Add remote IP access to your existing KVM. The ServerLink IP allows network administrators to manage, configure, troubleshoot and even reboot remote servers from a web browser.



Our Price **\$719** Save **\$55**
WebCode.....COM0096

See page 2 for details

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D-Link 108G Wireless Storage Router with USB ports (DI-624S)

D-Link, an industry leader in networking, introduces another breakthrough in wireless connectivity

Wirelessly Share a Broadband Internet Connection at speeds up to 108Mbps. Also features two USB 2.0 Ports to Connect and Share either an USB External Hard Disk Drive or Printer. 802.11g, 802.11b Compatible. Advanced Firewall and Parental Control plus QoS Network priority technology.

PCMCIA wireless card (DLK5401) **\$68**
PCI wireless card (DLK5400) **\$70**
USB device (DLK6021) **\$77**



Our Price \$175 Save \$54
WebCode DLK9989

Share an external Hard Drive across your network

D-Link 54Mbps Wireless Router (DI-524)

Capable of transferring data with a maximum wireless signal rate of up to 54Mbps in the 2.4GHz frequency — the same wireless frequency as 802.11b. The D-Link DI-524 Wireless Router also offers four Ethernet ports to support multiple computers

PCMCIA wireless card (DLK9992) **\$39**
PCI wireless card (DLK9991) **\$39**
USB device (DLK1153) **\$48**



Our Price \$86 Save \$34
WebCode DLK9994

D-Link 54Mbps Wireless Router & USB Print Server (DI-524UP)

This 54Mbps Wireless Broadband Router also includes a Built-in USB Print Server. Built-in 4-port Fast Ethernet switch for a hard wired connection to the network. Advanced Firewall & Parental Control Easy web-based management from any browser.

PCMCIA wireless card (DLK9992) **\$39**
PCI wireless card (DLK9991) **\$39**
USB device (DLK1153) **\$48**



Our Price \$118 Save \$46
WebCode DLK9988

D-Link Wireless Media Player (DSM-320)

D-Link introduces the latest addition to its multimedia family of products: the D-Link DSM-320 Wireless Media Player. The DSM-320 unites your network with your home entertainment centre, allowing you to share, access, and enjoy your digital media, whether it is music, videos or photos in the comfort of your living room.



Our Price \$352 Save \$48
WebCode DLK0129

D-Link Wireless 108G MIMO Router (DI-634M)

With the D-Link DI-634M wireless 108G MIMO router, you can create a robust wireless network that boasts powerful performance and extended coverage and enjoy the full benefits of wireless connectivity. You can now deploy the next-generation wireless network with dramatic performance improvements.

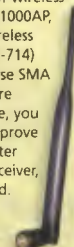
PCMCIA wireless card (DLK6023) **\$102**
PCI wireless card (DLK6022) **\$126**



Our Price \$194 Save \$35
WebCode DLK6024

D-Link 5dBi Gain Dipole Antenna (DWL-50AT)

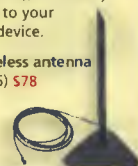
The D-Link DWL-50AT is a 5dBi Gain Dipole Antenna with Reverse SMA connector. It can help to improve the transmit rate and extend the transmit distance of wireless access point (DWL-1000AP, DWL-900AP) or wireless gateway router (DI-714) which have a reverse SMA connector. To ensure better performance, you should not only improve the RF on transmitter but also that on receiver, i.e. a high gain card.



Our Price \$29 Save \$6
WebCode DLK0210

D-Link Indoor 5dBi Wireless Antenna (ANT24-0501)

A High-Gain omni-directional antenna designed for 2.4GHz ISM band indoor use. It can be used with 802.11b and 802.11g wireless LAN devices such as access points and remote routers. It can be connected to your wireless device through an extension cable (provided with the antenna), or directly attached to your wireless device.



7dBi wireless antenna (DLK9245) **\$78**

Our Price \$64 Save \$16
WebCode DLK0141

D-Link VoIP Terminal Adapter (DVG-2001S)

The DVG-2001S VoIP Terminal Adapter links traditional telephony networks to IP networks with conventional telephony devices such as analog phones or fax machines. This product has one RJ-12 port to connect to a standard phone and one Ethernet port to connect to a network.



Our Price \$80 Save \$39
WebCode DLK9252

D-Link 54Mb Wireless VoIP Router (DVG-G1402S)

The 54Mbps Wireless Broadband Router allows you to make and receive voice calls over the same line that you connect to the Internet. Expensive long-distance & international phone calls over ordinary telephone services can be avoided. Plug two analog phones/fax machines into two RJ-12 ports, boost network performance with QoS, & share broadband via 4-port Fast Ethernet switch or Wireless connection.



Our Price \$204 Save \$46
WebCode DLK9253

D-Link GigaExpress Gigabit Switch (DGS-1005D)

Get the blazing speed of Gigabit Ethernet with the D-Link GigaExpress DGS-1005D, a 5-port 10/100/1000Mbps Gigabit Switch that delivers power, performance, and reliability in one cost-effective, space-saving design. Increase the speed of your network server and backbone connections, or make Gigabit to the desktop a reality.

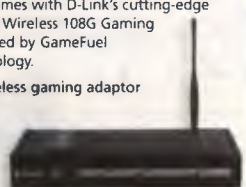


Our Price \$77 Save \$23
WebCode DLK0666

D-Link Wireless 108G Gaming Router (DGL-4300)

Push the limits of basic networking technology and experience the evolution in networking. Wirelessly share broadband Internet, boost network performance, stay competitive in your online games with D-Link's cutting-edge GamerLounge Wireless 108G Gaming Router, powered by GameFuel Priority Technology.

DGL-3420 wireless gaming adaptor **\$149**



Our Price \$245 Save \$55
WebCode DLK6007

D-Link USB/Ethernet ADSL Modem (DSL-502T)

Using ADSL technology, your Internet speeds can be up to 150 times faster than a 56K modem over a standard phone line. Two computers can simultaneously connect via the USB and ethernet port to share its high-speed internet connection. You can connect to its ethernet port regardless of the operating system you are using, or connect to its USB port to allow easy installation to a USB equipped computer.



Our Price \$75 Save \$45
WebCode DLK9977

D-Link ADSL Modem with 54Mbps Wireless Router (DSL-G604T)

With a built-in ADSL interface, 802.11g high-speed wireless LAN, 4 10/100BASETX Ethernet switch ports and advanced router functions, this device gives your business a convenient and cost-effective way to install a fast secure, bottleneck-free network link to the outside world. The DSL-G604T is an ADSL Router designed for home or office use.



Our Price \$133 Save \$47
WebCode DLK5109

D-Link 2.4Ghz Wireless Range Extender (DWL-G710)

D-Link introduces the latest product in the AirPlus G family designed to increase the range of your wireless network. This Wireless Range Extender takes an existing 802.11g wireless signal and "repeats" it to enable wireless connectivity in the backyard, garage or any areas where your original wireless signal cannot reach.



Our Price \$131 Save \$28
WebCode DLK9463

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 3 Year Warranty

Engin Voice Box 1

- Connect to Engin and get some of the lowest local, national and international call rates ever.
- Convert your normal analogue phone signal to digital so it can be sent over your broadband connection.
- 30 day trial period and 1 month free service fee.



Our Price **\$139**

WebCode.....LNK1221

Engin Voice Box 2

- The Engin Voice Box series 2 connects both your existing phone line and your new Engin service through the one handset.
- Take advantage of Engin's low call rates wherever you are to make and receive phone calls to anyone anywhere worldwide.
- 30 day trial period, 1 month free service fee.



Our Price **\$199**

WebCode.....LNK1222

Linksys Cordless Internet Telephony Kit (CIT200)

- Complete cordless Internet phone solution for Skype
- Connects Skype to Skype
- Connects Skype to regular phone lines (with Skype In/Out service)
- Plug and dial - easy to install and easy to use



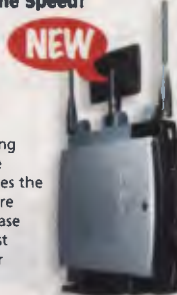
Our Price **\$199** Save **\$40**

WebCode.....LNK5463

Linksys Wireless-N Broadband Router (WRT300N)

Start a Wireless Network With Up To 4X the Range and 12X the Speed!

The Wireless-N Broadband Router is really three devices in one box. First, there's the Wireless Access Point, which lets you connect to the network without wires. There's also a built-in 4-port full-duplex 10/100 Switch to connect your wired-Ethernet devices together. Finally, the Router function ties it all together and lets your whole network share a high-speed cable or DSL Internet connection. The Access Point built into the Router uses the very latest wireless networking technology, Wireless-N (draft 802.11n). By overlaying the signals of multiple radios, Wireless-N's "Multiple In, Multiple Out" (MIMO) technology multiplies the effective data rate. Unlike ordinary wireless networking technologies that are confused by signal reflections, MIMO actually uses these reflections to increase the range and reduce "dead spots" in the wireless coverage area. The robust signal travels farther, maintaining wireless connections up to 4 times further than standard Wireless-G.



Our Price **\$214**

Save **\$66**

WebCode.....LNK5547

Linksys IP Phone (SPA941)

Advanced, Affordable, Feature Rich IP Telephone for Homes and Businesses

Stylish and functional, the SPA941 VoIP telephone is designed for a residence or business using an IP PBX, a hosted IP telephony service, or a large scale IP Centrex deployment. The SPA941 leverages Linksys' industry leading VoIP technology to deliver an upgradeable, high quality IP telephone that is unparalleled in features, value, and support.

The SPA941's standard features include a graphical display, speakerphone, 2.5 mm head-set port, and two active lines. With a simple software update, the SPA941 can be upgraded to a four line phone. Each line can be independently configured to use a unique phone number (or extension), or it can be configured to use a shared number that is assigned to multiple phones.



Save money with VoIP

Our Price **\$214**

Save **\$55**

WebCode.....LNK1227

Linksys 5-Port 10/100 Switch (SP205)

- Five auto-sensing 10/100 switched ports with auto MDI/MDI-X crossover detection
- Up to 200Mbps full duplex bandwidth at each port
- Compact size fits into any environment - includes wall-mount slots
- Address Learning and Aging, and Data Flow Control for enhanced transmission reliability



Our Price **\$46**

Save **\$14**

WebCode.....LNK0030

Linksys 8-Port 10/100 Switch (SP208)

- Eight auto-sensing 10/100 ports with auto MDI/MDI-X crossover detection
- Up to 200Mbps full duplex bandwidth at each port
- Address Learning and Aging, and Data Flow Control for enhanced transmission reliability
- Compact size fits into any environment - includes wall-mount slots



Our Price **\$62**

Save **\$18**

WebCode.....LNK0031

Linksys Wireless-N Notebook Adapter (WPC300N)

High-speed Wireless-N networking for your notebook computer

- High-speed Wireless-N (draft 802.11n) networking for your notebook computer
- MIMO technology uses multiple radios to create a robust signal that travels up to 4 times further and reduces dead spots
- Up to 12 times faster than Wireless-G, but can also connect to Wireless-G and -B networks.



Our Price **\$170**

Save **\$49**

WebCode.....LNK5546

Linksys Wireless-G Bridge for Phone Adapters (WBP54G)

Convert your IP Phone to use Wireless-G networking!

- Put an IP Phone wherever you want, with no cabling hassle
- Connects an IP Phone to a Wireless-G network
- Shares power with the IP Phone - only one AC Adapter necessary
- Wireless connection protected by WEP, WPA or WPA2 encryption



Our Price **\$57**

Save **\$22**

WebCode.....LNK5473

Linksys 16-Port 10/100 Switch (SP216)

- Ideal for integrating your 10BaseT and 100BaseTX Network Hardware
- 16 10/100 ports provide dedicated bandwidth in half or full-duplex modes
- Each port supports auto MDI/MDI-X cable Detection
- Compatible with all major network operating systems



Our Price **\$118**

Save **\$52**

WebCode.....LNK0032

Linksys Wireless-G Game Adapter (WGA54G)

- Lag-free head-to-head or Internet gaming at up to 54Mbps, without stringing wires
- Converts wired-Ethernet-ready game consoles to Wireless-G (draft 802.11g) network connectivity
- Works without drivers on PlayStation2, Xbox, and GameCube
- Also connects to Wireless-B (802.11b) networks at 11Mbps



Our Price **\$129**

Save **\$40**

WebCode.....LNK0053

Linksys Compact Wireless-G Internet Video Camera (WVC54GC)

Send live video to a web browser anywhere in the world!

- Sends high-quality live video to your network wirelessly - viewable from Windows PCs anywhere
- Built-in stand-alone web server, no PC necessary
- Security Mode automatically sends email alerts with video clips upon motion detection
- Supports up to four remote users simultaneously.



Our Price **\$198**

Save **\$52**

WebCode.....LNK5528

Linksys Wireless-G USB Network Adapter with Wi-Fi Finder (WUSB54G)

All-in-One USB Network Adapter and Wi-Fi Finder

- High-speed Wireless-G networking for your desktop or notebook computer
- Easy to read display shows network name, channel, signal strength, and security on/off
- Built-in Wi-Fi Finder detects Wireless-G and Wireless-B signals
- Wireless signals are protected by up to 128 bit WEP or WPA encryption



Our Price **\$107**

Save **\$62**

WebCode.....LNK5526

See page 2 for details!

smart club 3% rebate

Did you know that you can get up to 3% rebate on every order? www.csw.com.au/smartbuy

Netgear RangeMax NEXT Wireless Router (WNR834B)

RangeMax NEXT wireless routers and adapters deliver maximum bandwidth and wireless coverage up to 270Mbps. Steady-Stream connections enable simultaneous use of voice, data, and multimedia applications throughout the home. Elegant preset internal antenna design and 11n-True-Test testing and tuning, ensures optimal out-of-box performance.



Our Price \$231 Save \$48

WebCode NTG7935

Netgear RangeMax NEXT Wireless Notebook Adapter (WN511B)

Experience the NEXT generation – up to 270Mbps wireless networking. Features include?

- Steady-Stream connection for your notebook computer at great range
- Complies with draft 802.11n, backwards compatible and with 11b/g WiFi
- Interoperates at up to 270Mbps with other Intensi-fi products
- Optimum performance & maximum coverage with preset internal antennas.



Our Price \$185 Save \$44

WebCode NTG7936

Netgear 8 Port Gigabit Ethernet Switch (GS608)

This sleek, affordable powerhouse lets you build a small scale, high-speed network that moves even very large files across your network instantly. It allows you to mix-and-match 10/100/1000 Ethernet devices for flexibility and seamless migration to Gigabit Ethernet. Packed with ease-of-use features, it's also self-cooling and operates quietly without a fan.

GS605 5 Port Gigabit Ethernet Switch (NTG7187) \$91



Our Price \$144 Save \$35

WebCode NTG7186

Netgear ProSafe VPN Firewall 25

NETGEAR's FVS124G ProSafe Dual WAN VPN Firewall provides maximum performance, security, and reliability for small and remote offices. Four auto-sensing Gigabit ports deliver fast LAN connectivity; SPI firewall with 256-bit AES or 3DES encryption protects your network. 25 VPN connections with hardware-assisted throughput secure remote links.



Our Price \$334 Save \$85

WebCode NTG7354

Netgear RangeMax ADSL Modem Wireless Router (DG834PN)

NETGEAR's RangeMax wireless router is powered by 6 smart antennas which adapt on-the-fly to interference, eliminating dead spots and delivering up to 5x more wireless coverage and speed than 802.11g. RangeMax MIMO (Multi-In, Multi-Out) technology is 100% 802.11b/g compatible and provides legacy devices with up to 50% improvement in performance.

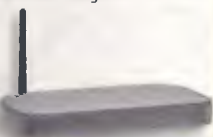


Our Price \$259 Save \$70

WebCode NTG7582

Netgear Super G Wireless ADSL Router with 4-port switch (DG834GT)

Lets you instantly and safely download large files, video conference, and distribute and play high-quality digital movies, photos, and MP3's. Protects your network against intruders. Super G for extra speed and range.



Our Price \$225 Save \$64

WebCode NTG7301

Netgear Storage Central (SC101)

Plug in up to 2 IDE drives of any size and create a central storage space for all your music, video, photos, games, and files that is accessible by all the PCs on your network. Keep your most valuable files safe with advanced, automatic backup features, and keep them private from other network users if desired.



Our Price \$185 Save \$54

WebCode NTG7350

Netgear ProSafe 802.11g Wireless Access Point

Affordable, standards-based enterprise-level functionality with robust security, integrated IEEE 802.3af PoE and SNMP. Wi-Fi Certified with speeds up to 108 Mbps, providing reliable access for the mobile workforce.

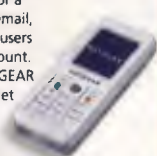


Our Price \$197 Save \$62

WebCode NTG7302

Netgear Skype WiFi Phone (SPH101)

NETGEAR's Skype WiFi Phone is the first that lets you make free domestic and international calls to other Skype users over a wireless network without being tied to a PC. It's great to use at home or work where you have wireless access, whether or not it is WEP encrypted. For a small fee, you can have voicemail, or even talk with non-Skype users on ordinary phones at a discount. With Skype WiFi Phone, NETGEAR makes mobile wireless Internet telephony a reality.



Our Price \$410 Save \$89

WebCode NTG7626

Netgear ACE Configured Broadband Voip Adapter (TA612V)

NETGEAR's TA612V Broadband Voice Adapter lets you experience fast network connectivity and has built-in a phone adapter that delivers convergent voice services (VoIP) to your home networking environment. Powerful, secure, private, and easy to use, but best of all, it helps save money on phone calls with VoIP phone service.



Our Price \$145 Save \$34

WebCode ACE001

Netgear Broadband VOIP Adapter With 1 Phone Port (WGR613V)

Integrated Firewall, Router, DHCP and PPPoE Client.

- 1 VoIP port (POTS) for connection to a standard telephone. Allowing two separate phone numbers and accounts with your VSP.
- Quality of service (QoS) on voice call through prioritisation of voice data.
- WAN port for connection to your existing broadband modem.
- 3x LAN ports for connection to your existing network.
- 802.11G 54MB wireless access point.



Our Price \$182 Save \$47

WebCode NTG7611

Netgear 54 Mbps Wireless Router and PC Card Kit (WGB511BDL1)

This complete kit sets you free to take your notebook computer anywhere without being tied to ethernet cables. Enjoy broadband internet connection sharing and access to network resources at up to 54 Mbps. Double firewall provides superior protection from hackers. High-level encryption ensures confidentiality and prevents unauthorised access to your network.



Our Price \$97 Save \$22

WebCode NTG7071

Netgear Gigabit PCI Adapter (GA311)

Transfers even huge video, CAD, and database files at astonishing speeds. Up to 10 times faster than fast ethernet and 100 times faster than 802.11b wireless, it easily and instantly connects you to other networked computers, printers, routers, and network storage. Easy installation requires fewer than five mouse clicks.



Our Price \$27 Save \$12

WebCode NTG7154

Netgear ProSafe VPN Firewall 8 with 4 Port 10/100 Mbps Switch (FVS114)

Compact FVS114 ProSafe VPN Firewall 8 offers strong encryption, 8 IPSec VPN connections, SPI firewall, intrusion detection, URL filtering, and more. SNMP, Smart Wizard, VPN Wizard simplify set up and use. Compatible with leading VPN devices, including Cisco, Juniper/Netscreen, Checkpoint, works with all major operating systems. Optimised for ProSafe VPN client software and NMS100.



Our Price \$139 Save \$30

WebCode NTG7353

Netgear ProSafe 24 Port 10/100 Smart Switch

NETGEAR's ProSafe Smart Switch affordably delivers built-in gigabit power and fiber flexibility at an attractive price. With 24 10/100 ports, two Gigabit Ethernet ports, and an SFP slot, growing business networks can keep up with expanding network needs. In addition, a Web-browser interface offers simple switch management, making it easy to configure ports, trunks, VLANs, and prioritisation



Our Price \$454 Save \$115

WebCode NTG7304

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 5 Year Warranty

TRENDnet Adv. Day/Night Internet Camera Server with Audio (TV-IP301)

The Advanced Day/Night Internet Camera Server with Audio is perfect for transmitting real-time video over the Internet. This camera provides high quality streaming video with frame rates up to 30fps. Users can view up to 16 cameras on one screen at any time.



Our Price \$843 **Save \$116**
WebCode.....TDN0181

TRENDnet Adv. Pan/Tilt Internet Camera Server (TV-IP400)

This full-featured surveillance camera provides high quality video over a wired network connection. Built-in CPU and Web Server allow users to access the camera anywhere in the world using a Web browser.

Wireless Advanced Pan & Tilt Internet Camera Server (TDN0184) \$519



Our Price \$382 **Save \$57**
WebCode.....TDN0183

TRENDnet Professional Cable Tester with Tone Generator (TC-NT2)

The TC-NT2 is a convenient and comprehensive cable tester for network professionals. Its powerful and user-friendly features enable network installers to accurately check pin configurations of various voice and data communication cables. The TC-NT2 includes a master unit that transmits test signals to its corresponding remote terminator to verify cable reliability.



Our Price \$123 **Save \$26**
WebCode.....TDN0075

TRENDnet 108Mbps 802.11g MIMO Wireless Router (TEW-601R)

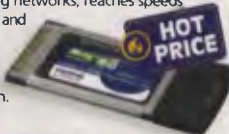
Using the latest technology, the MIMO 802.11g Wireless Router offers a robust wireless solution to extend wireless coverage and improve network performance. It's also back-ward compatible with 802.11g and 802.11b, so legacy wireless devices can benefit from MIMO's extended range. For bandwidth intensive applications, the MIMO wireless router offers intelligent stream handling and automatic traffic prioritization.



Our Price \$219 **Save \$50**
WebCode.....TDN0165

TRENDnet 108Mbps 802.11g MIMO Wireless PC Card (TEW-601PC)

Designed to give you wider coverage, the MIMO 802.11g Wireless PC Card seamlessly connects to your wireless network without performance degradation. It also supports universal wireless connectivity with 802.11b or 802.11g networks, reaches speeds of up to 108Mbps, and secures wireless transmissions with either WPA or WEP encryption.

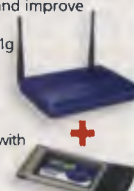


Our Price \$121 **Save \$28**
WebCode.....TDN0103

TRENDnet 108Mbps MIMO Wireless Router & PCMCIA Card Bundle

Using the latest technology, the MIMO 802.11g Wireless Router offers a robust wireless solution to extend wireless coverage and improve network performance.

- Wi-Fi Compliant with IEEE 802.11g and IEEE 802.11b Standards
- Supports Ad-Hoc (Peer-to-Peer) Mode or Infrastructure (AP-Client) Mode
- Supports Super G Technology with Data Rate up to 108Mbps (8X Faster)



Our Price \$232 **Save \$191**
WebCode.....TDN0232

TRENDnet 108Mbps MIMO Wireless Router & PCI Card Bundle

Using the latest technology, the MIMO 802.11g Wireless Router offers a robust wireless solution to extend wireless coverage and improve network performance.

- Wi-Fi Compliant with IEEE 802.11g and IEEE 802.11b Standards
- Supports Ad-Hoc (Peer-to-Peer) Mode or Infrastructure (AP-Client) Mode
- Supports Super G Technology with Data Rate up to 108Mbps (8X Faster)



Our Price \$232 **Save \$211**
WebCode.....TDN0233

TRENDnet 108Mbps 802.11g MIMO Wireless PCI Adapter (TEW-603PI)

Designed to give you wider coverage, the 108Mbps 802.11g MIMO Wireless PCI Adapter seamlessly connects to your wireless network without performance degradation. It also supports universal wireless connectivity with 802.11b or 802.11g networks, reaches speeds of up to 108Mbps, and secures wireless transmissions with either WPA or WEP encryption.



Our Price \$135 **Save \$44**
WebCode.....TDN0104

TRENDnet 1108Mbps 802.11g MIMO Wireless Access Point (TEW-610APB)

The 108Mbps 802.11g MIMO Wireless access point gives your wireless devices the freedom to operate at any location with reduced system interference or dropouts. Add this device to your Ethernet network, and you'll have reliable, high-speed wireless access, which provides wider coverage than standard 802.11b or 802.11g wireless networks.



Our Price \$249 **Save \$50**
WebCode.....TDN0006

Visit www.csw.com.au for more product information!

TRENDnet 24-Port 10/100Mbps Fast Ethernet Rack Mount Switch (TE100-S24)

Rack-mountable Fast Ethernet Switch eliminates unnecessary traffic and relieves congestion on critical network paths. With 10/100Mbps NWay technology, the TE100-S24 automatically negotiates between 10Base-T and 100Base-TX network speeds. The auto MDI/MDI-X detection automatically corrects for crossover connection and allows direct switch-to-switch or switch-to-hub connection.



Our Price \$173 **Save \$46**
WebCode.....TDN0222

TRENDnet 48-Port Gigabit Web-Based Smart Switch (TEG-448WS)

TRENDnet's TEG-448WS 48-Port 10/100/1000Mbps and 4-Slot Mini-GBIC Web-Based Smart Switch delivers high performance and scalability for large enterprises. Its Mini-GBIC slots can use either single or multimode fibre for constructing a high-speed network backbone. The TEG-448WS supports advanced network protocols such as VLAN, QoS, Trunking, and Mirroring.



Our Price \$2120 **Save \$549**
WebCode.....TDN0217

TRENDnet 26-Port Gigabit Web Smart PoE Switch (TPE-224WS)

This Smart Switch integrates Power over Ethernet and network management features. It reduces equipment cost by delivering data and power over existing network cable infrastructure. The switch offers advanced network management features such as VLAN and QoS to meet secured network applications.



Our Price \$1157 **Save \$341**
WebCode.....TDN0230

TRENDnet Cat6 48-port Unshielded Patch Panel (TC-P48C6)

Prepare yourself for Copper Gigabit Ethernet with TRENDnet's Cat. 6 RJ-45 UTP Patch Panels. These patch panels are certified for 250MHz Category 6, which are perfect for Copper Gigabit Ethernet connections. TRENDnet's 16/24/48-port Cat. 6 Patch Panels are ideal for Ethernet, Fast Ethernet and Copper Gigabit Ethernet (1000Base-T) network applications. Using TRENDnet's Cat. 6 products now, will prepare you for the high bandwidth network in the future without re-cabling your network.

Cat6 24-port Unshielded Patch Panel (TC-P24C6) (TDN0085) \$106

Cat6 16-port Unshielded Patch Panel (TC-P16C6) (TDN0084) \$76



Our Price \$197 **Save \$42**
WebCode.....TDN0086

TRENDnet Punch Down Tool with 110 and Krone Blade (TC-PDT)

TRENDnet's professional punch down tool, TC-PDT with 110 and Krone blades, inserts and cuts terminations in one operation. Adjustable high and low activation setting accommodates termination requirements or user preference. With spare storage to prevent blade loss, the precision blades are conveniently interchangeable and reversible between 110 and Krone.



Our Price \$48 **Save \$12**
WebCode.....TDN0079

TRENDNet Cable/DSL 4-Port Firewall Router (TW100-BRF114)

TRENDNet's TW100-BRF114 4-Port Cable/DSL Firewall Router allows multiple users to share internet access protected from unwanted intruders via a robust Stateful Packet Inspection Firewall (SPI). Multiple Web Patrol features allow parents and Network Administrators to restrict internet access based on clients' IP Addresses, Time/Date, URL Keywords and Service Types.



Our Price **\$107** Save **\$22**
WebCode TDN0167

TRENDNet 5-Port Copper Gigabit Switch (TEG-S50TXE)

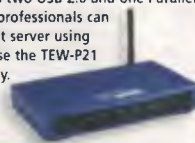
TRENDNet's TEG-S50TXE Copper Gigabit Ethernet Switch with External Power Supply comprises five 10/100/1000Mbps Copper Gigabit Ethernet ports with Auto-negotiation and Auto-MDIX features. Users can connect Server(s) to the Gigabit port(s) to increase network performance or cascade Copper Gigabit Switches together to create high-bandwidth Gigabit backbones.



Our Price **\$112** Save **\$27**
WebCode TDN0210

TRENDNet 54Mbps 802.11g Multi-Port Print Server 2 USB 2.0 & 1 Parallel Printer Port (TEW-P21G)

TRENDNet TEW-P21G wireless print server transforms a stand-alone USB or Parallel printer into a shared network printer. Compatible with IEEE 802.11g 54Mbps network it has two USB 2.0 and one Parallel printer port. Network professionals can easily manage the print server using Web Browser and utilise the TEW-P21 to promote productivity.



Our Price **\$262** Save **\$67**
WebCode TDN0160

TRENDNet 2- Port PS/2 Audio KVM Switch (include 2 x KVM cables) (TK-208K)

The TRENDNet 2-Port PS/2 Audio KVM Switch allows you to share your monitor, keyboard and mouse as well as microphone and speakers. With its Hot-Plug, Auto-Scan and Hot-Key features, the TK-208K is the perfect choice for managing 2 PCs.

4-port PS2 KVM Switch Kit w/Audio (Include 4 x KVM Cables) (TK-408K) (TDN0148) **\$105**



Our Price **\$63** Save **\$16**
WebCode TDN0139

TRENDNet 8-Port 100Base- FX Layer 2 Managed Switch with GBIC Slot (TEG-S08FX)

The 8-Port 100Base-FX Layer 2 Managed Switch provides exceptional performance, ease of use and flexibility for expanding network operations. Utilising a robust 3.8Gbps backplane, the switch can easily accommodate multiple networks at 2km or more with an optional GBIC SX or LX module. Advanced management features include SNMP, VLAN, IGMP and Port Security.



Our Price **\$1362** Save **\$337**
WebCode TDN0187

TRENDNet GBIC Multi- mode SX module (TEG-GBSX)

- Compliant with Gigabit Interface Converter, Fiber Channel and SONET/SDH
- Industry Standard GBIC package
- Duplex SC connector
- Up to 1.25Gbps Bi-Directional Data Links
- Full Metallic Enclosure for low EMI
- Hot Pluggable
- Class 1 Laser product complies with EN 60825-1

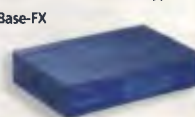


Our Price **\$156** Save **\$42**
WebCode TDN0036

TRENDNet 10/100Mbps TX to 100Base-FX Multi- Mode (SC Type) Fiber Converter (TFC-110MSCE)

TRENDNet's TFC-110MSCE Fibre Media Converter transforms 10/100Base-TX UTP/STP media to 100Base-FX media and vice versa. The 10/100 Base-TX Port Auto-Negotiating 10 or 100Mbps connection speed with Auto-MDIX media type.

10/100Mbps TX to 100Base-FX Multi-Mode (ST Type) Fiber Converter (TFC-110MSTE) (TDN0047) **\$126**



Our Price **\$126** Save **\$28**
WebCode TDN0046

TRENDNet 54Mbps 802.11g 9dBi High Power Wireless Outdoor AP Bridge (TEW-412APB0)

TRENDNet's TEW-412APB0 High Power Wireless Access Point provides Wireless Access Point, Bridging and Repeater functions in one unit. With 9 dBi built-in antenna and weather proof housing, it's ideal for both indoor and outdoor wireless applications. Features Wi-Fi Protected Access (WPA) with Temporal Key Integrity Protocol (TKIP) to ensure high level of data integrity.



Our Price **\$962** Save **\$267**
WebCode TDN0001

TRENDNet 8dBi Outdoor Omni-Directional Antenna Kit (TEW-OA080K)

TRENDNet's TEW-OA080K Outdoor Omni Directional Antenna Kit increases the coverage area of your wireless network. As an optional antenna for your 2.4GHz IEEE 802.11b and 802.11g wireless network equipments, you can install it indoor or outdoor to extend the coverage area. The antenna can simply be mounted on the wall or on a pole.



Our Price **\$134** Save **\$15**
WebCode TDN0016

TRENDNet 24dBi Outdoor Directional Antenna (TEW-OA24D)

TRENDNet's TEW-OA24D 24dBi High Gain Outdoor Reflector Grid Antenna provides extended coverage range for your existing 802.11b or 802.11g Wireless Local Area Network (WLAN). TEW-OA24D comes with female N-type antenna connector.



Our Price **\$327** Save **\$62**
WebCode TDN0018

TRENDNet Bluetooth USB Adapter (TBW-101UB)

Venture into the wireless realm with TRENDNet Bluetooth technology. Enhance your PCs with Bluetooth peripherals. Unclutter your workspace with TRENDNet's TBW-101UB Bluetooth wireless technology. Compliant with USB 1.1, Bluetooth 1.1 and 1.2



Our Price **\$45** Save **\$14**
WebCode TDN0087

TRENDNet ClearSky Wireless Bluetooth VoIP Phone Kit - Skype (TVP-SP1BK)

The ClearSky Bluetooth VoIP Phone provides a cost effective solution that allows you to make phone calls anywhere around the world. Streamline calling procedures by taking advantage of Skype features such as Contacts, Call List, SkypeOut, and Conference Call. The rechargeable Lithium-ion battery can also sustain 6 hours of conversation. ClearSky Long Range Support up to 100 meters. Compatible with Windows 2000/XP.

**Bluetooth connectivity
gives you greater freedom!**



Our Price **\$188** Save **\$20**
WebCode TDN0072

TRENDNet USB 2.0 All-in-1 Memory Card Reader/Writer (TMR-61U2)

TRENDNet's TMR-61U2 USB 2.0 All-in-1 Memory Card Reader/Writer provides an ideal solution to read and write up to six types of memory cards including MultiMedia, CompactFlash, IBM Micro Drive, Smart Media, Secure Digital and Memory Stick. Transfer large files between your computer, digital camera, PDA, MP3 player and more.



Our Price **\$39** Save **\$8**
WebCode TDN0231

**Buying the latest IT Hardware?
Why not extend your warranty?
See page 2 for details!**

**UP TO
5 Year
Warranty**

Consumables

HP LaserJet 3050

HP LaserJet Q2612A Black Print Cartridge - 2,000 Sheets (HPL2612) **\$101**

HP 3 Year Return To Depot Warranty (HPW6987) **\$141**

HP LaserJet 3052

HP LaserJet Q2612A Black Print Cartridge - 2,000 Sheets (HPL2612) **\$101**

HP 3 Year Return To Depot Warranty (HPW6987) **\$141**

HP LaserJet 3055

HP LaserJet Q2612A Black Print Cartridge - 2,000 Sheets (HPL2612) **\$101**

HP 3 Year Return To Depot Warranty (HPW6987) **\$141**

HP LaserJet 3390

HP LaserJet Q5949A Black Print Cartridge - 2,500 Sheets (HPL5949) **\$103**

HP LaserJet Q5949X Black Print Cartridge - 6,000 Sheets (HPL5994) **\$188**

HP 3 Year Onsite Warranty (HPW2659) **\$338**

HP LaserJet 1020

HP LaserJet Q2612A Black Print Cartridge - 2,000 Sheets (HPL2612) **\$101**

HP 3 Year Onsite Exchange Warranty (HPW5510) **\$141**

HP LaserJet 1022

HP LaserJet Q2612A Black Print Cartridge - 2,000 Sheets (HPL2612) **\$101**

HP 3 Year Onsite Exchange Warranty (HPW5510) **\$141**

HP LaserJet 1320

HP LaserJet Q5949A Black Print Cartridge - 2,500 Sheets (HPL5949) **\$103**

HP LaserJet Q5949X Black Print Cartridge - 6,000 Sheets (HPL5994) **\$188**

HP Next Business Day Onsite 3 Year Warranty (HPW5473) **\$99**

HP LaserJet 2420

HP LaserJet Q6511A Black Print Cartridge - 6,000 Sheets (HPL5949) **\$103**

HP LaserJet Q6511X Black Print Cartridge - 12,000 Sheets (HPL5994) **\$178**

HP Next Business Day Onsite 3 Year Warranty (HPW3791) **\$158**

HP LaserJet 2600

HP LaserJet Q6511A Black Print Cartridge - 6,000 Sheets (HPL5949) **\$103**

HP LaserJet Q6511X Black Print Cartridge - 12,000 Sheets (HPL5994) **\$178**

HP Next Business Day Onsite 3 Year Warranty (HPW0114) **\$177**

HP LaserJet 2840

HP Color LaserJet Q6000A Black Print Cartridge (HPL6060) **\$109**

HP Color LaserJet Q6001A Cyan Print Cartridge (HPL6061) **\$119**

HP Color LaserJet Q6002A Yellow Print Cartridge (HPL6062) **\$119**

HP Color LaserJet Q6003A Magenta Print Cartridge (HPL6063) **\$119**

HP LaserJet 3055 A4 Mono All-in-one Printer

Benefit from full functionality with the compact, flatbed HP LaserJet 3055 All-in-One. Versatile and reliable, it lets you produce professional documents quickly with fast print, fax, scan and copy functions, plus network connectivity.

- Print: 18ppm, first page out less than 8 sec, 1200 x 1200 dpi 264MHz, 64MB RAM
- Copy: Flatbed 600 x 600 dpi, 24 bit depth
- Scan: 600 x 600 dpi optical resolution (9600 dpi enhanced) colour scanning
- Fax: 33.6kbps



Our Price **\$670**

Save **\$151**

WebCode HPL6530

HP LaserJet 3050 A4 Mono all-in-one printer

With HP's known reliability and quality, the LaserJet 3050 brings 4 in 1 functionality (fax, print, scan, copy) to provide a space saving solution for business and home users. The LaserJet 3050 All-in-One is a joy to use with an easy to follow control panel which has a simple, 2-line, 16-character backlit display that requires no training. HP's expert knowledge will help you make the most of your All-in-One and ensure your equipment is running at peak efficiency.

Print: 18ppm, First page out less than 8 sec, 1200 x 1200 dpi 264MHz, 64MB RAM

Copy: 600 x 600 dpi, 24 bit depth

Scan: 600 x 600 dpi (up to 19,200 dpi enhanced)

Fax: V.34 fax modem - 33.6 kbps



Our Price **\$441**

Save **\$58**

WebCode HPL6504

HP LaserJet 3052 A4 Mono All-In-one Printer

- Print: 18ppm, first page out less than 8 sec, 1200 x 1200 dpi 264MHz, 64MB RAM
- Copy: Flatbed 600 x 600 dpi, 24 bit depth
- Scan: 600 x 600 dpi optical resolution (9600 dpi enhanced) colour scanning



Our Price **\$531**

Save **\$68**

WebCode HPL6520

HP LaserJet 1020 A4 Mono Printer

- Up to 15 ppm (letter), 14 ppm (A4)
- Less than 10 seconds with Instant-on Technology
- 1200 dpi effective output quality
- 234 MHz Processor
- Memory 2 MB RAM
- 5,000 pages per month duty cycle



Our Price **\$199**

Save **\$44**

WebCode HPL5911

HP LaserJet 2420 A4 Mono Printer

- Print speed of up to 30 ppm (letter), 28 ppm (A4)
- 32 MB RAM, expandable to 288 MB
- 100-sheet multipurpose tray
- 250-sheet input tray



Reliable, Easy-to-use

Our Price **\$1035**

Save **\$229**

WebCode HPL5956

HP LaserJet 2600n A4 Colour Printer

- 8 ppm A4 black & colour
- 600 x 600 dpi
- 35,000 pages per month duty cycle
- 1 USB 2.0 port
- 1 built in Fast Ethernet wired networking port
- 16MB Memory



Our Price **\$554**

Save **\$243**

WebCode HPL6455

HP LaserJet 1320 A4 Mono Printer

Produce professional, black-and-white documents quickly with HP LaserJet 1320 printers. Ideal for individuals and small work teams, this series also offers flexible networking options and automatic two-sided printing.

- Up to 22 ppm, letter (up to 21 ppm, A4)
- 1200 dpi resolution
- 133 MHz Motorola V4 Coldfire processor
- 16 MB RAM, expandable to 144 MB with one open, industry-standard, 100-pin DIMM slot
- 10,000 pages per month

Fast, expandable, network - capable



Our Price **\$529**

Save **\$112**

WebCode HPL5927

HP LaserJet 3390 A4 Mono All-In-one Printer

Improve productivity for essential office tasks with the high-performance HP LaserJet 3390 All-in-One series. This networked, flatbed device delivers fast, professional quality black-and-white printing, faxing, colour scanning and digital copying

- Print: 21ppm, first page out less than 10 sec, 1200 x 1200 dpi 264MHz, 64MB RAM
- Copy: Flatbed 600 x 600 dpi, 24 bit depth
- Scan: Flatbed 1200 x 1200 dpi (up to 19,200 dpi enhanced)
- Fax: V.34 fax modem - 33.6 kbps



Our Price **\$981**

Save **\$109**

WebCode HPL6500

HP LaserJet 1022 A4 Mono Printer

- Up to 19 ppm letter (up to 18 ppm A4)
- Less than 8 seconds with Instant-on Technology
- 8,000 pages per month duty cycle
- Processor 266 MHz
- Memory 8 MB RAM
- True 1200 dpi



Our Price **\$279**

Save **\$58**

WebCode HPL5912

HP LaserJet 2840 AIO A4 Colour Printer

Your 3-in-1 business centre for professional colour laser print, copy and scan (network-ready)

- 19ppm mono and 4ppm colour
- 50 sheet Automatic Document Feeder, 125 sheet multi purpose tray, optional 250 sheet second tray
- 96MB RAM, 264MHz processor
- 600 x 600 dpi with ImageREt 2400
- Friendly LED screen



Our Price **\$1530**

Save **\$338**

WebCode HPL3905

See page 2 for details
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Fuji Xerox Phaser 8500DN

A4 Colour Solid Ink Printer

- Up to 85,000 pages maximum monthly duty cycle
- Print speed of 24 ppm
- First page out in 6 seconds
- Resolution 600 x 600 dpi
- Memory up to 256MB
- Adobe PostScript 3 and PCL5c
- Duplex printing



Our Price \$1567 **Save \$1067**
WebCode.....FXP8510

**Environmentally
Friendly & Easy to use!**

Fuji Xerox DocuPrint C2535A

A4 Colour Laser Printer

- Black print speed 35ppm
- Colour print speed 25ppm
- Memory size 128MB upgradeable to 640MB
- Max duty cycle up to 90,000ppm
- Resolution 1200 x 1200 dpi
- Paper capacity 700 sheets standard, 2350 max
- Very low cost per print



Our Price \$1511 **Save \$244**
WebCode.....FXP2535

**Duplex & network ready
with uncompromised
reliability & performance**

Fuji Xerox DocuPrint C4350

A3 Colour Office Printer

A Complete in-house printing and finishing solution. Perfect colour laser printer for busy workgroups and demanding graphics and creative departments that require fast dependable performance and quality results.

Speed, Power and Quality

- 35 ppm colour; 45 ppm mono
- 600 MHz Power PC G3 processor
- up to 768 MB RAM
- up to 3,110-sheet paper capacity
- real 1,200 x 1,200 dpi
- Fuji Xerox EA-HG toner

WAN/LAN Networking

- Internet Printing Protocol (IPP) support
- Citrix® Metaframe® support
- 100Base-TX/10Base-T interface



Our Price \$5391 **Save \$873**
WebCode.....FXP4350

Consumables

Fuji Xerox

Docuprint 203A & 204A

Fuji Xerox Mono Toner 2.5k
Page Yield (FXP2416) \$69
Fuji Xerox Drum 12k Page
Yield (FXP2417) \$98

Fuji Xerox

Docuprint C525

Fuji Xerox Drum Cartridge
(FXP0531) \$285

Fuji Xerox Toner Cartridge
Yellow (FXP0532) \$190

Fuji Xerox Toner Cartridge
Magenta (FXP0533) \$190

Fuji Xerox Toner Cartridge
Cyan (FXP0534) \$190

Fuji Xerox Toner Cartridge
Black (FXP0535) \$109

Fuji Xerox

Phaser 8500DN

Fuji Xerox Ink Cartridge
Cyan 3 Pack (FXP8551) \$136

Fuji Xerox Ink Cartridge
Magenta 3 Pack (FXP8552) \$136

Fuji Xerox Ink Cartridge
Yellow 3 Pack (FXP8553) \$136

Fuji Xerox Ink Cartridge
Black 3 Pack (FXP8554) \$136

Fuji Xerox 8500 2 Year Extended
Warranty (FXP8516) \$510

Fuji Xerox

Docuprint C2535A

Fuji Xerox DocuPrint Yellow
Cartridge (FXP2539) \$335

Fuji Xerox DocuPrint Magenta
Cartridge (FXP2540) \$335

Fuji Xerox DocuPrint Cyan
Cartridge (FXP2541) \$335

Fuji Xerox DocuPrint Black
Cartridge (FXP2542) \$104

Fuji Xerox Total 3 Year Onsite
Service (FXP2545) \$500

Fuji Xerox

Docuprint PE220

Fuji Xerox Mono Toner
Cartridge (FXP0683) \$98

Fuji Xerox

Docuprint C4350

Fuji Xerox Mono Toner
Cartridge (FXP4352) \$98

Fuji Xerox Cyan Toner
Cartridge (FXP4353) \$485

Fuji Xerox Magenta Toner
Cartridge (FXP4354) \$485

Fuji Xerox Yellow Toner
Cartridge (FXP4355) \$485

Toner Waste Box 2.5k
(FXP4363) \$48

Fuji Xerox

WorkCentre C2424DN

Fuji Xerox Ink Cartridge for
C2424 3 Pack Black
(FXP2418) \$108

Fuji Xerox Ink Cartridge for
C2424 6 Pack Black Ink
(FXP2422) \$147

Fuji Xerox Ink Cartridge for
C2424 3 Pack Cyan Ink
(FXP2419) \$147

Fuji Xerox Ink Cartridge for
C2424 3 Pack Magenta Ink nk
(FXP2420) \$147

Fuji Xerox Ink Cartridge for
C2424 3 Pack Yellow Ink nk
(FXP2421) \$147

Print samples available on the entire Fuji Xerox range!
Please call City Software on 1300 658 600 to arrange

Fuji Xerox DocuPrint 203A

A4 Mono Laser Printer

- Print Speed 20ppm
- Resolution: HQ1200 (2400 x 600 dpi) print resolution
- First page out time less than 10secs
- Connectivity: USB 2.0 Full Speed, IEEE 1284 Parallel
- Memory Size of 8MB

DocuPrint 204A
(FXP0204) \$283



**Ideal for
personal use!**

Our Price \$141 **Save \$22**
WebCode.....FXP0203

Fuji Xerox DocuPrint C525 A

A4 Colour Laser Printer

- Black print speed 25ppm
- Colour print speed 5ppm
- First page out in 9 seconds black, 17 seconds colour
- Memory size 64MB
- Max duty cycle 45,000 ppm
- Resolution 9600 x 600 image enhancement
- Paper capacity 250 sheets Standard, 950 maximum

Award Winning!



Our Price \$487 **Save \$102**
WebCode.....FXP0525

Fuji Xerox WorkCentre PE220

Black & White Multifunction Printer

The WorkCentre PE220 is big in performance and small in size making it suitable for small businesses and workgroups, branch offices and individual users. Clean, efficient laser printing Razor sharp copying Great colour and monochrome scanning



**Print/Copy
Fax/Scan**

Our Price \$422 **Save \$77**
WebCode.....FXP1220

Fuji Xerox WorkCentre C2424DN

Colour Multifunction

- Internal Hard Disk of 40GB (standard)
- Print speed of 24 ppm
- First print page out in 6 seconds
- Resolution: 2400 FinePoint™, 600 x 600 dpi.
- Memory of up to 1GB
- First copy out in 15 seconds in full colour
- Scan to mailbox, Scan to TWAIN, Scan to PC
- Scans up to 20 ppm

Perfect for Small Office



Our Price \$3662 **Save \$613**
WebCode.....FXP2424

Business Printers & Consumables

Buying the latest IT Hardware?
Why not extend your warranty!
See page 2 for details!

**UP TO
5 Year
Warranty**

Consumables

Epson CX3700, CX 4700, CX5700F + C87

Epson DURABrite Ultra Black Ink Cartridge (EPA0631) **\$14**
Epson DURABrite Ultra High Capacity Black Ink Cartridge (EPA0621) **\$19**
Epson DURABrite Ultra Cyan Ink Cartridge (EPA0632) **\$13**
Epson DURABrite Ultra Magenta Ink Cartridge (EPA0633) **\$13**
Epson DURABrite Ultra Yellow Ink Cartridge (EPA0634) **\$13**

Epson RX530

Epson STYLUS PHOTO Black Ink Cartridge (EPA5190) **\$14**
Epson STYLUS PHOTO Cyan Ink Cartridge (EPA5290) **\$14**
Epson STYLUS PHOTO Magenta Ink Cartridge (EPA5390) **\$14**
Epson STYLUS PHOTO Yellow Ink Cartridge (EPA5490) **\$14**

Epson R650, R230 + R350

Epson STYLUS PHOTO Black Ink Cartridge (EPA0890) **\$17**
Epson STYLUS PHOTO Cyan Ink Cartridge (EPA0511) **\$17**
Epson STYLUS PHOTO Magenta Ink Cartridge (EPA0512) **\$17**
Epson STYLUS PHOTO Yellow Ink Cartridge (EPA0513) **\$17**
Epson STYLUS PHOTO Light Cyan Ink Cartridge (EPA0514) **\$17**
Epson STYLUS PHOTO Light Magenta Ink Cartridge (EPA0515) **\$17**

Epson C1100, CX11N & CX11NF

Epson AcuLaser Yellow Developer Cartridge High Capacity (EPL1105) **\$163**
Epson AcuLaser Magenta Developer Cartridge High Capacity (EPL1106) **\$163**
Epson AcuLaser Cyan Developer Cartridge High Capacity (EPL1107) **\$163**
Epson AcuLaser Yellow Developer Cartridge Standard Capacity (EPL1108) **\$111**
Epson AcuLaser Magenta Developer Cartridge Standard Capacity (EPL1109) **\$111**
Epson AcuLaser Cyan Developer Cartridge Standard Capacity (EPL1111) **\$111**
Epson AcuLaser Black Developer Cartridge High Capacity (EPL1104) **\$103**

For entire
Epson consumables
range see
www.csw.com.au

Epson Stylus CX3700 A4 MFC Economical All-in-one with individual ink cartridges

- Epson DURABrite ink for improved print quality & durability
- Absolute versatility with support for a broad range of Epson media
- Offers the versatility to zoom or enlarge when photocopying
- True Borderless edge-to-edge printing and copying up to A4
- 5760 x 1440 optimised dpi with Epson's Resolution Performance Management Technology
- Vibrant photos on plain or Genuine Epson specialty papers that last up to 120 years
- Individual Intellidrive ink cartridges for greater economy
- Hi-res scanning up to 600 x 1200 dpi
- Powerful & easy to use bundled software



Get \$100
Cashback!*

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Our Price **\$118**

Save **\$19**

WebCode.....EPI3700

Epson Stylus Photo RX530 A4 MFC Photo Quality Multi-Function Printer

- Built-in 1.5-inch image viewer
- True borderless edge-to-edge printing
- Extensive standalone photograph printing features and options
- High resolution 2400 x 2400 film scanning
- Standalone colour and black-and-white photocopy functionality
- 5760 x 1440 optimised dpi using Resolution Performance Management technology
- PictBridge and USB Direct Printing support
- Individual Intellidrive ink cartridges for even greater economy
- Epson Creativity Suite for easy photo printing and file management
- Versatile with a broad range of media, including Glossy 5" x 7" paper



Our Price **\$223**

Save **\$41**

WebCode.....EPI0530

Epson Stylus Photo R350 A4 Photo Printer

- Built In 2.4" Colour LCD Preview Screen
- Card Slots & PictBridge for PC Free Printing
- CD/DVD Printing
- 6 Individual Ink Cartridge
- True BorderFree edge to edge photo printing
- 5760x1440 Optimised dpi using Epson's RPM Technology



Our Price **\$223**

Save **\$41**

WebCode.....EPI0350

Epson Stylus Photo R230 A4 Photo Printer

- 5760 x 1440 optimised dpi
- True borderless edge-to-edge printing
- Six Individual ink cartridges
- Quick 15ppm for colour and black and white text pages
- CD/DVD printing



NEW

Our Price **\$159**

Save **\$28**

WebCode.....EPI0230

Epson Stylus Photo RX650 A4 Colour Multifunction

- Built-in 2.5-inch LCD photo viewer
- Direct copy and print CD/DVD designs
- Standalone photo printing
- High resolution 3200 x 6400 scanner with built-in transparency unit
- 5760 x 1440 optimised dpi using Resolution Performance Management Technology
- Standalone colour and black-and-white photocopy functionality



Our Price **\$443**

Save **\$79**

WebCode.....EPI0650

Epson STYLUS C87 A4 Photo Printer

- Epson DuraBrite Ultra Ink-Set 120 years lightfastness
- 5760x1440 Optimised DPI Using RPM Technology
- Up to 22ppm
- Individual Ink Cartridges
- True Border Free Edge to edge printing on A4 and 4x6 paper



Our Price **\$114**

Save **\$18**

WebCode.....EPI0087

Epson Stylus CX5700F A4 MFC Affordable All-in-one Print, Copy and Faxing solution

- Built-in colour fax functionality
- Standalone colour and black-and-white photocopy functionality
- Epson DURABrite Ultra ink for improved print quality and durability
- Individual Intellidrive ink cartridges for even greater economy
- Powerful and easy-to-use bundled software
- PictBridge and USB Direct Printing support
- 5760 x 1440 optimised dpi with Resolution Performance Management Technology
- Vibrant photos on plain or Genuine Epson specialty papers that last up to 120 years
- Simple plug and print connectivity
- True Borderless edge-to-edge photo printing and copying up to A4.



Our Price **\$271**

Save **\$48**

WebCode.....EPI5700

Epson Stylus CX4700 A4 Multifunction

Epson's leadership in photographic quality printing technologies, in combination with powerful scanning and copying functionality, is fully evident in the new Epson STYLUS CX4700 — an all-in-one printer, scanner and copier featuring versatility at every level.

- Vibrant Photos on plain or specialty papers that last up to 120 years
- Individual ink cartridges
- True borderless edge-to-edge printing
- Hi-res Scanning (1200 x 2400 dpi)
- 3 Memory card slots for 12 card types
- 5760 x 1440 optimised dpi
- High speed copies



Our Price **\$141**

Save **\$24**

WebCode.....EPI4101

Epson AcuLaser C1100 A4 Colour Laser Printer

- Superior high quality colour printing
- Print speeds of 25ppm B/W, 5ppm colour
- Great print resolution at 600dpi
- Flexible interfaces, parallel and USB
- Networking model: AL-C1100N
- Paper capacity of 180 sheets (80 gsm)
- Memory 32MB STD; max: 256MB



Our Price **\$681**

Save **\$133**

WebCode.....EPL1113

Epson AcuLaser CX11NF A4 Colour Multifunction

- High speed printing at up to 25ppm B/W, 5ppm colour
- Full faxing capabilities with 60 speed dials
- Optical scanning resolution up to an enhanced 9600dpi
- Auto document feeder
- Sharp text and images a print resolution of 2400dpi



Our Price **\$1338**

Save **\$160**

WebCode.....EPL0012

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Lexmark X342n A4

Plug and print ... and share

Fast, affordable multifunction for small workgroups!

Network-ready, with optional input capacity of up to 800 sheets, the X342n is a reliable team player for your small-workgroup environment.

A boost in productivity

Advanced workflow functions include high-speed faxing, colour scanning in multiple formats, and fast laser printing at up to 25 ppm.

Easier on your budget

Besides its exceptionally low acquisition price, it also offers high-yield 6K cartridges to help drive down your total cost of printing.

- 25ppm Mono
- Ethernet 10/100 connectivity standard
- Small Workgroup / Home Office



Our Price **\$545** Save **\$195**
WebCode.....LEX0142

Lexmark X642e A4

Business-class features

An incredible value in multifunction!

Enhance your workflow with standard fax, scan-to-email, USB Direct printing, email address look-up, and much more.

Touch-screen simplicity

The large, intuitive touch-screen interface allows end-users to carry out printing and maintenance tasks quickly and easily.

Lightning-fast performance

Sprint through print runs at up to 43 ppm, and use the 50-page Automatic Document Feeder to scan and copy with ease.

- 43ppm Mono
- Network Colour Scanning Standard
- Corporate Address Book Lookup



Our Price **\$2298** Save **\$530**
WebCode.....LEX2601

Lexmark C500n

Print, Copy & Scan A4

Fast mono printing, Great mono performance with the added benefit of colour and network!

Above all, the C500n is built for high-speed mono printing, delivering up to 31 ppm with the first page out in as little as 13 seconds.

Affordable colour

It's also great for those occasional print jobs where colour is essential, from financial presentations to external marketing tools.

Built to share

Network-ready, ultra quiet and very easy to use, it's ideal for sharing in any small-workgroup office environment.

- 31ppm Mono / 8ppm Colour
- Ethernet 10/100 connectivity standard
- Easy to Use



Our Price **\$568** Save **\$108**
WebCode.....LEX2226

Consumables

Lexmark E120N

Lexmark Mono Toner (LEX2210) **\$102**

Lexmark Mono Hi Capacity Toner (LEX2406) **\$142**

Lexmark X8350

Lexmark Twin Pack Black & Colour Cartridges (LEX6364) **\$55**

Lexmark Twin Pack Black Cartridges (LEX6363) **\$51**

Lexmark T642N

Lexmark High Yield Print Cartridge (LEX6427) **\$452**

Lexmark Mono Print Cartridge (LEX6428) **\$181**

Lexmark High Yield Print Cartridge for Labels (LEX6426) **\$471**

Lexmark T430DN

Lexmark T430 Mono Cartridge (LEX1438) **\$167**

Lexmark T430 Mono High Yield Cartridge (LEX1439) **\$281**

Lexmark C920DN

Lexmark C920 Black Toner Cartridge (LEX1929) **\$279**

Lexmark C920 Cyan Toner Cartridge (LEX1928) **\$425**

Lexmark C920 Magenta Toner Cartridge (LEX1930) **\$425**

Lexmark C920 Yellow Toner Cartridge (LEX1931) **\$425**

For entire Lexmark Consumables range see www.csw.com.au

Konica Minolta Magicolor 2490MF A4 Colour Multi-function

Konica Minolta is perfect for professionals working at home or in small offices, space is not a luxury. However, this does not limit the need for productivity and flexibility. The Magicolor 2490MF printer copier meets all of your requirements. This quality colour laser printer copier provides you with a total office solution in a single device.

- Print speed up to 20 ppm A4 mono and 5 ppm colour
- Copy speed up to 12 ppm A4 mono and 5 ppm colour (1 to 1)
- Resolution up to 2400 x 600 dpi (print), 600 dpi (copy and scan)
- Stand alone Fax functionality
- Solid 50 sheets ADF unit
- 128 MB RAM
- 1 year on-site warranty



Our Price **\$1398** Save **\$151**
WebCode.....QMS2492

Konica Minolta Magicolor 2500W A4 Personal Colour

The Konica Minolta Personal colour laser. This small, fast and cost effective printer is a welcome addition to any team. It is designed to be easier to use, and to run with less consumables. The polymerised toner creates outstanding print quality, and the revolutionary design also reduces waste.

- Print speed up to 20 ppm mono (A4/letter), 5 ppm colour (A4/letter)
- Resolution up to 2400 x 600 dpi
- 32MB RAM Standard Memory (max)
- 200-sheet multipurpose paper tray
- USB 2.0 Hi Speed
- 2 year on-site warranty (Next day service)
- Microsoft Windows



Our Price **\$456** Save **\$43**
WebCode.....QMS2500

Konica Minolta magicolor 2400W, 2430DL, 2500W + 2490MF

Konica Minolta Toner Cartridge Yellow 1.5k (QMS2401) **\$90**

Konica Minolta Toner Cartridge Magenta 1.5k (QMS2402) **\$90**

Konica Minolta Toner Cartridge Cyan 1.5k (QMS2403) **\$90**

Konica Minolta Toner Cartridge Black 4.5k (QMS2404) **\$130**

Konica Minolta Toner Cartridge Yellow 4.5k (QMS2405) **\$196**

Konica Minolta Toner Cartridge Magenta 4.5k (QMS2406) **\$196**

Konica Minolta Toner Cartridge Cyan 4.5k (QMS2407) **\$196**

Konica Minolta magicolor 5430DL

Konica Minolta Toner Cartridge 6K Black (QMS5433) **\$166**

Konica Minolta Toner Cartridge 6K Yellow (QMS5434) **\$237**

Konica Minolta Toner Cartridge 6K Magenta (QMS5435) **\$237**

Konica Minolta Toner Cartridge 6K Cyan (QMS5436) **\$237**

For entire Konica Minolta consumables range see www.csw.com.au

Konica Minolta Magicolor 2530DL A4 Workgroup Colour

Konica Minolta connects your digital camera directly to this printer. Imagine a compact colour laser printer that everyone can share! Whole workgroups can benefit from cost effective colour printing with the NEW magicolor 2530 DeskLaser. It is easy to use and integrates direct photo print for fast and easy printout of photos from your PictBridge enabled digital camera.

- Print speed up to 20 ppm mono (A4/letter), 5 ppm colour (A4/letter)
- Resolution up to 2400 x 600 dpi
- 64MB RAM Standard Memory (max. 576MB)
- 200-sheet multipurpose paper tray
- USB 2.0 Hi Speed, Ethernet (10/100BaseTX), PictBridge
- 2 year on-site warranty (Next day service)
- Microsoft Windows, Mac OS, Linux



Our Price **\$593** Save **\$56**
WebCode.....QMS2530

Konica Minolta Magicolor 5430DL A4 Mid-Range Network Colour

Konica Minolta is a professional solution ideal for creatively communicating in colour! Konica Minolta's pioneer Polymerised toner combined with the high precision 2400dpi resolution allows you to produce business reports, charts, booklets, spreadsheets, flyers and stationery in stunning colour.

- Print speed up to 21 ppm colour/mono (letter), 20 ppm colour/mono (A4)
- Resolution up to 2400 x 600 dpi
- 64MB RAM Standard Memory (max. 576MB)
- PageScope Raster language
- 250-sheet universal cassette
- USB 2.0 Hi Speed, Ethernet (10/100BaseTX)
- 1 year on-site warranty (Next day service)
- Microsoft Windows, Mac OS, Linux



Our Price **\$1087** Save **\$212**
WebCode.....QMS5430

Business Printers & Consumables

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 3 Year Warranty

Consumables

Canon IP 1600/MP170

Canon CL-41 FINE Colour Cartridge (CAN0426) **\$34**

Canon PG-40 FINE Black Cartridge (CAN0435) **\$32**

Canon CL-51 FINE Colour Cartridge (High Yield) (CAN0427) **\$48**

Canon PG-50 FINE Black Cartridge (High Yield) (CAN0436) **\$42**

Canon IP4200, MP500, MP830

Canon PGI-5BK Black Ink Tank (CAN0437) **\$23**

Canon CLI-8BK Photo Black Tank (CAN0429) **\$23**

Canon CLI-8C Cyan Ink Tank (CAN0430) **\$23**

Canon CLI-8M Magenta Ink Tank (CAN0431) **\$23**

Canon CLI-8Y Yellow Ink Tank (CAN0434) **\$23**

Canon MF5750

Canon CARTU LBP Toner Cartridge (CAN0502) **\$105**

Sennheiser HD212PRO Closed Stereo Monitoring Headphone

Balanced sound image with a slight emphasis on the bass response. DJs will like their excellent attenuation of ambient noise and the soft, comfortable ear pads.



Our Price \$110 **Save \$20**
WebCode.....SNH0006

Dvico TViX Mini

- Watch most movie file formats
- Listen to MP3's through hi-fi sets or car audio systems
- View Digital Photo's on your TV
- USB stick compatible
- Adapted USB2.0 OTG (On-The-Go) technology.



Our Price \$255 **Save \$45**
WebCode.....DVC0017

Canon Pixma IP1600 A4 Inkjet Printer

- 2 picolitre FINE technology for sharper image quality
- ChromaLife 100 ink for long-lasting photos
- Print at up to 4800 x 1200dpi resolution
- Borderless photo printing up to A4
- Prints at up to 19ppm black and 16ppm colour



Our Price \$69 **Save \$10**
WebCode.....CAN0417

Canon Pixma IP4200 A4 Inkjet Printer

- 1 picolitre FINE print-head technology
- ChromaLife 100 ink for long-lasting photos
- Up to 9600 x 2400dpi print resolution
- Prints directly onto printable CD and DVDs
- Borderless photo printing up to A4
- Individual ink tanks with photo black for improved image contrast
- Digital camera printing
- Auto duplexing



Our Price \$178 **Save \$21**
WebCode.....CAN0419

Canon Pixma MP170 A4 Multifunction

- 2 picolitre FINE print-head technology
- ChromaLife 100 ink for long-lasting photos
- Produce high-quality photos and documents at up to 4800 x 1200 dpi
- Print a borderless 6" x 4" photo in 55 sec
- Scan high-quality photos and documents at up to 1200 x 2400 dpi
- USB 2.0 Hi-Speed interface ensures fast data transfer



Our Price \$139 **Save \$20**
WebCode.....CAN0439

Canon Pixma MP830 A4 Multifunction

- Full colour printer, copier, scanner & fax
- 1 picolitre FINE print-head technology, providing up to 9600 x 2400dpi printing
- Dual paper path, auto duplex, mobile phone and digital camera & direct CD/DVD printing
- 5 individual ink tanks for greater economy
- Auto duplex scanning



Our Price \$479 **Save \$70**
WebCode.....CAN0497

Canon Pixma MP500 A4 Multifunction

- 1 picolitre FINE print-head technology providing up to 9600 x 2400dpi
- ChromaLife 100 ink for long-lasting photos
- Print & copy up to 29ppm black & 19ppm colour
- 2.5" LCD screen to view memory card contents
- Direct digital camera & photo card printing
- Borderless photo printing up to A4
- Dual paper path, auto duplex & CD/DVD printing
- Scan resolution 1200 x 2400dpi



Our Price \$264 **Save \$35**
WebCode.....CAN0468

Canon Pixma MF5750 A4 Multifunction

- Networkable high resolution laser printer, fax, scanner, and digital copier all-in-one
- Laser copy quality (20cpm, 600 x 600dpi)
- Electronic collating and 2-on-1 copy to fit two originals on one page
- 50-page document feeder
- Huge 250 page fax memor
- Optional network printing
- 64MB SDRAM
- CCD scanning



Our Price \$438 **Save \$61**
WebCode.....CAN0445

Wacom Intuos3 Seriously-enhanced, Interactive & Creative

Intuos3 is the industry standard graphics tablet for digital art, animation, image editing and computer graphics. The Intuos3 features ExpressKeys and Touch Strip(s) can substitute all common modifiers and shortcuts, whilst the ergonomic pen delivers professional level functionality.

- 1024 levels of pressure sensitivity in the battery free and cordless pen
- 64 degrees of tilt sensitivity
- 8 express keys and 2 touch strips
- 5080 lines per inch resolution
- 200 points per second report rate
- USB connectivity for PC and Mac



Academic 6x8 (WAC9983) **\$369**
Intuos3 9x12 (WAC0930) **\$605**
Intuos3 9X11 wide format (WAC1231) **\$605**

Our Price \$484 **Save \$65**
WebCode.....WAC0630

Wacom Interactive Pen Display DTI-520 The Evolution of Visual Communication

Combines the XGA 15" TFT LCD monitor with a Wacom tablet. It can be easily connected to a projector for an enlarged screen. You can hand-write and draw naturally on screen with an intuitive pen interface, while the audience can see the annotations in real-time on the projector. Lets you maintain face-to-face communication and integrate feedback easily.

- Flush LCD cover surface lets your hands and ideas flow easily
- Adjust inclination angle of display for easy stroke creation and viewing
- Cordless & battery-free pen with DuoSwitch
- 512 levels of Pressure Sensitivity for pen tip and eraser



Our Price \$1549 **Save \$101**
WebCode.....WAC0200

Wacom Graphire Bluetooth (6x8) - Wireless Freedom

With the new Graphire Bluetooth you have the ability to do pen based drawing, sketching, illustration and powerful presentations where and when they want - without any annoying cabling.

A battery life of up to 25 hours, two on-tablet programmable ExpressKeys designed to optimize workflow by providing quick access to commonly used modifiers, mouse-clicks, and keystrokes plus a 4 meter cable on the universal power adapter make it a very convenient tool.

- Bundled software:**
- Adobe Photoshop elements 3
 - Corel Painter Essentials2
 - Inspiration



Our Price \$496 **Save \$23**
WebCode.....WAC0104

Wacom BIZ Tablet The ideal tool to enhance your presentations!

Compact and portable with a host of powerful features, the BizTablet will revolutionize your presentation and communication abilities.

With the two programmable function keys on the tablet and two programmable side-switches on the pen, you can set any shortcuts you prefer.

Make handwriting notes directly into your documents.

- Tablet size: 156(W) x 139(D) x 13.5 (H) mm
- Active area: 81x58 mm
- 512 levels of pressure sensitivity

Bundled Software:
JustWrite Office - Lets you directly write into your documents.



Our Price \$61 **Save \$9**
WebCode.....WAC0105

Mediatek 3.5" Wireless Hard Disk Media Player

The MG-350HD is so simple to use!
Simply download movies, music or photos from the internet or through a P2P program; save the contents into a 3.5" HDD (to be purchased separately); stream the contents from a PC through a wireless LAN connection and then connect the unit to your TV to watch movies, listen to music or look at photos.

- Supports HD MPEG-2 and MPEG-4 files
- Supports JPEG, BMP, GIF and PNG still picture.
- Supports DVI, composite, s-video and component video outputs.
- 11g wireless connection and 10/100 ethernet port.
- USB 2.0 host port; USB storage devices can be attached and the stored content can be played directly.
- USB 2.0 slave port; provides an alternative way to download digital content from your PC directly.
- Ability to wirelessly stream media without a HDD.
- Enables file surfing from multiple sources on a TV using the remote control i.e. PCs on the network, HDD inside and USB devices attached."

Mediatek portable multimedia player/3.5 hdd enclosure (ALT2001) **\$235**



Our Price **\$329** Save **\$70**
WebCode ANY0349

I-Rocks Notebook Travel Pack Black

Includes Mouse, Card reader, Webcam & USB Hub



Our Price **\$83** Save **\$16**
WebCode IRS0043

TP-link 54m wireless router with 4 port switch

54M Wireless LAN Router, 2.4GHz, 802.11g/b, built-in 4-port Switch. Adopts 54M Super GTM and 2x to 3x eXtended Range technologies Up to 4-9 times the range of standard 802.11g/b Access Control, Integrated Firewall

TP-link 54m Wireless USB adaptor (ANY0302) **\$30**

TP-link 54m Wireless PCMCIA adaptor (ANY0303) **\$32**

TP-link 54m Wireless PCI adaptor (ANY0304) **\$30**



Our Price **\$72** Save **\$7**
WebCode ANY0301

TP-link 108m wireless router with 4 port switch

108M Wireless LAN Router, 2.4GHz, 802.11g/b, built-in 4-port Switch. Adopts 108M Super GTM and 2x to 3x eXtended RangeTM technologies Access Control, Integrated Firewall, Detachable Antenna.

TP-link 108m Wireless USB adaptor (ANY0306) **\$46**

TP-link 108m Wireless PCMCIA adaptor (ANY0307) **\$40**

TP-link 108m Wireless PCI adaptor (ANY0308) **\$42**



Our Price **\$85** Save **\$14**
WebCode ANY0305

i-rocks Accessories

MP3 Car DJ FM Transmitter, Now with track recognition

Black (IRS0026) **\$58**
Silver (IRS0024) **\$58**
White (IRS0025) **\$58**



Blue
Our Price **\$58** Save **\$10**
WebCode IRS0023

350K Web camera With Mic/Earphone

Black / Silver (IRS0038) **\$44**



White / Silver
Our Price **\$44** Save **\$5**
WebCode IRS0039

USB Skype/VOIP phone Save on call costs with VOIP

Black / Silver (IRS0033) **\$49**



Black / Silver
Our Price **\$49** Save **\$20**
WebCode IRS0033

12 In 1 card reader with 3 port USB 2.0 Hub

Black (IRS0029) **\$48**
Green (IRS0036) **\$48**
Red (IRS0032) **\$48**
Silver (IRS0028) **\$48**



Black
Our Price **\$48** Save **\$25**
WebCode IRS0030

Portable USB 2.0 Card Reader Supports MMC, MMC4.0, RS MMC, RS MMC4.0, SD, Mini SD & T-Flash Cards

Black (IRS0041) **\$16**



White
Our Price **\$16** Save **\$4**
WebCode IRS0040

Aten 2 Port Desktop KVM

Rugged 2 or 4 port desktop KVM in metal chassis. Connect one keyboard, mouse and monitor to 2 or 4 computers. No software required. Operate via push button or Hotkey. Slim 3 in 1 cables included in the box

ATEN 4 Port Desktop KVM (ANY0273) **\$119**



Our Price **\$68** Save **\$11**
WebCode ANY0272

Videomate PCI digital and analog TV tuner

- Power Up Scheduling
- Remote Controlled Power On/Off
- Low-profile card design
- Analog video/audio capture
- Support HDTV



Our Price **\$125** Save **\$74**
WebCode ANY0180

Aten 2 Port Compact KVM

The rugged Petite series of KVMs with built-in cables, feature a 50% smaller desktop footprint than traditional compact KVM switches.

Port selection via Hotkeys

- 2 Port with Audio (ANY0217) **\$48**
- 2 Port USB with Audio (ANY0218) **\$69**
- 4 Port with Audio (ANY0219) **\$88**
- 4 Port USB with Audio (ANY0220) **\$110**



Our Price **\$42** Save **\$7**
WebCode ANY0216

Videomate PCI digital TV tuner

- Power Up Scheduling
- Remote Controlled Power On/Off
- Low-profile card design
- Analog video/audio capture
- Support HDTV



Our Price **\$105** Save **\$54**
WebCode ANY0204

Plantronics bluetooth wireless headset system for mobile & desk phone

The Plantronics Voyager 510S Bluetooth Headset System-combining both the wireless Voyager 510 Bluetooth Headset and Bluetooth Desktopphone Adapter-allows you to seamlessly switch between your office phone and Bluetooth mobile phone.

- System includes: System includes:
- Bluetooth headset + charger
- Desktopphone Bluetooth adaptor
- (Handsets not included)
- Handset Lifter



Our Price **\$328** Save **\$21**
WebCode PLA0006

Videomate USB digital TV tuner

- One of the world's smallest digital TV tuners (only 9.0 x 2.6 x 1.1 cm).
- Can be plugged in to receive high-quality free-to-air digital terrestrial TV broadcast on your desktop or laptop PC.
- Uses high-speed USB 2.0
- SDTV and high definition 1080i HDTV reception on your PC.
- Offers EPG and Teletext features for more convenience.



Our Price **\$99** Save **\$52**
WebCode ANY0249

Hardware

Buying the latest IT Hardware?
Why not extend your warranty!
See page 2 for details!

UP TO
3 Year
Warranty

Nokia 3120 Mobile Phone

The funky, yet chic Nokia 3120 is packed with features allowing you to mix business with pleasure: MMS, Java technology, Tri-band and more. Complement it with stylish enhancements now.



Our Price \$167 **Save \$32**
WebCode: NMP3120

Nokia E61 3G Handset

- Optimised for mobile email
- Choice of email solutions
- Attachment content support capability
- Extensive range of connectivity methods
- Familiar Nokia voice functionalities
- Premium metals and thin construction



Our Price \$620 **Save \$129**
WebCode: NME0061

Nokia 6131 Mobile Phone

- Elegantly crafted with smooth edges and a rich textured feel
- One-touch push-to-open key and ergonomic keypad
- Impressive and large 2.2" QVGA main display in 16.7 million colours
- Integrated 1.3 megapixel camera with 8x digital zoom and video recorder
- Seamless connectivity with Bluetooth wireless technology, Infrared and USB 2.0
- Integrated digital music player and FM stereo radio



Our Price \$395 **Save \$84**
WebCode: NMH6131

Microsoft LifeCam VX-3000

High Definition Photos / Automatic Face Tracking Software

Take instant messaging with family and friends to a new level of sight and sound - with the Microsoft LifeCam VX-3000. This webcam is compatible with all leading instant messaging software, so it's simple and fun to use. Great video quality and features, plus crystal-clear audio, make you feel like you're right there!

- Superior video quality and High Definition still photos
- Automatic face tracking software
- Video effects
- Pan, tilt, and zoom controls
- Automatically adjusts for low-light conditions for improved video quality
- Built-in noise-cancelling microphone



Windows Live Messenger
Our Price \$79 **Save \$20**
WebCode: MST8426

Microsoft LifeCam VX-6000

High Definition Video and Photos / Wide-Angle Lens 3 x Digital Zoom

Say goodbye to sharing memories across miles by only typing and talking. You're about to experience a whole new dimension in instant messaging. With the Microsoft LifeCam VX-6000, you'll see High Definition, live video images. You'll hear sounds and voices as if they were in the same room with you.

- High Definition video (1.3 megapixels) and photos (5.0 megapixels interpolated)*
- Wide-angle lens, 3x digital zoom**
- Automatic face tracking software**
- Automatically adjusts for low-light conditions for superior video quality
- Video effects
- Built-in noise-cancelling microphone



Windows Live Messenger
Our Price \$117 **Save \$32**
WebCode: MST8425

Microsoft Wireless Laser Mouse 5000

High Definition Laser Technology / Magnifier / Tilt Wheel

Wireless Laser Technology for performance and precision! Microsoft High Definition Laser Technology delivers precise, responsive, and smooth tracking. The Tilt Wheel provides efficient 4-way scrolling while the Magnifier lets you quickly enlarge and edit documents, spreadsheets, and photo details. Plus, the sleek wireless symmetrical design feels comfortable in either hand.

- More Responsive 1000 dpi
- More Precise
- Smoother Tracking Microsoft Intelligent Tracking System smaller CMOS
- 4-Way Scrolling
- Magnifier
- Comfort and Design
- Wireless Freedom



Our Price \$69 **Save \$20**
WebCode: MST8421

Microsoft Comfort Optical Mouse 1000

Optical Technology / Comfort / Scroll Wheel

Comfort and value in an optical mouse! All these features make the Microsoft Comfort Optical Mouse 1000 a great value: Comfort - with an ergonomic design that fits either hand. Simplicity - with no software, it's easy to set up and use. A scroll wheel - for faster on-screen navigation. Optical Technology - for greater accuracy and control.



Our Price \$22 **Save \$8**
WebCode: MST8422

Microsoft Wireless Optical Desktop 2000

Comfort Curve Keyboard / Optical Mouse

Get comfort and freedom with this sleek wireless keyboard and mouse! The Microsoft Wireless Optical Desktop 2000 features a compact, Comfort Curve keyboard that lets your hands rest naturally and comfortably. It offers a quiet, responsive, thin-profile keyboard with Media and Hot Keys for one-touch access to programs you use most. Completing the set is a wireless mouse with Microsoft Optical Technology for greater accuracy and control.

- Wireless Keyboard**
- No charging station, less desktop clutter
 - Media Keys and Hot Keys
 - Spill-Resistant Design
- Wireless Optical Mouse**
- Comfortably designed for use in either hand
 - Average 6+ Months of Battery Life
 - Magnifier
 - Optical Technology



Our Price \$77 **Save \$22**
WebCode: MST8424

Microsoft Wireless Optical Mouse 2000

High Definition Technology / 6+ Months Battery Life / Comfort

With the Microsoft Wireless Optical Mouse 2000, you simply get more: Comfort - featuring recessed sides and a comfortable grip. High Definition Optical Technology - for greater precision and response. Simplicity - with no software, it's easy to set up and use. Plus, wireless freedom and long battery life - for greater convenience and fewer interruptions.

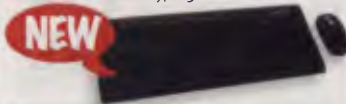


Our Price \$39 **Save \$20**
WebCode: MST8423

Microsoft Wireless Optical Desktop 700

Wireless Keyboard / Wireless Optical Mouse

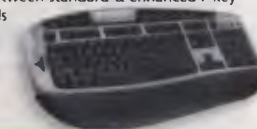
Wireless freedom, optical control, optimal value! Get the reliability you expect from Microsoft hardware at an extraordinary value - with the Microsoft Wireless Optical Desktop 700. This keyboard and optical mouse combine the freedom of wireless with the control of an optical mouse with scroll wheel. Plus, it's easy to use - just plug in the receiver and start typing.



Our Price \$45 **Save \$15**
WebCode: MST8427

Microsoft Digital Media Professional Keyboard

- The zoom slider makes it easy to take a close look at pictures, maps, documents & Web pages without taking hands off the keyboard
- Enjoy easy access to favourite music, video clips & media programs with the press of a key
- Five easy to set customisable "Favorites" keys
- Perform common tasks, with the touch of a key
- Toggle between standard & enhanced F-key commands



Our Price \$45 **Save \$15**
WebCode: MST8344

Microsoft Natural Ergonomic Keyboard 4000

- Ergonomic "split design"
- Inbuilt Scroll wheel
- New key layout improved for Ergonomic enthusiasts
- New 14 degree gable and proprietary "gull wing" design
- New cushioned wrist rests
- Wired USB



Our Price \$62 **Save \$18**
WebCode: MST8406

Harmony 880 Remote Control

Optimised for complicated HDTV and PVR systems, the Harmony 880 helps you tame tough configurations like switching your television between video aspect ratios depending on the program source. The interactive color display lets you quickly choose a 16:9 ratio for movies and HDTV, or a standard 4:3 ratio for basic television programming.

Easy to setup

Just connect your Harmony remote to your computer and the Web wizard walks you step-by-step through a simple set up.

Easy to get help

There's even a handy "HELP" button to guide you through simple troubleshooting and get you back in control.

Easy to Use

The Harmony Remote is the world's only remote with Smart State Technology. Just press one of the Activity buttons.

Never out of date

The Harmony Remote device database is constantly updated with new components and fine-tuned settings.



Our Price **\$266** Save **\$123**
WebCode.....LOG3499

Logitech's X-140 stereo speakers

Logitech's X-140 stereo speakers have the quality and innovation you expect from Logitech. The innovative two-driver acoustic design provides enhanced bass in a slim profile. Dynamic, real-time bass equalization maximizes bass response while minimizing distortion. Connect your portable MP3 or CD player to the convenient 3.5mm auxiliary input.



Our Price **\$48** Save **\$12**
WebCode.....LOG3569

Logitech Cordless 2.4GHz Presenter

Take advantage of its 50-foot range to control your presentations while moving around an auditorium with confidence. A built-in LCD timer with vibration alerts at five and two minutes helps you effectively manage your time.



Our Price **\$109** Save **\$21**
WebCode.....LOG3495

Logitech Cordless Desktop MX 5000 Laser

It's the smart desktop that combines an LCD keyboard display, a high-speed Bluetooth® wireless hub with SecureConnect™ technology, the precision of a MX™ Laser mouse, and innovative touch-sensitive media controls. It keeps you connected, saves you time, and simplifies your life in ways you've never imagined.

LCD keyboard display

Receive notification of new IM or email messages, view application information, check the date and time, or see caps lock status at a glance.

Touch-sensitive media controls

Glide to the desired volume or image size. Programmable smart keys launch your favourite applications, websites or folders.

Ready for Windows Media Center Edition 2005

The MX 5000 Laser works seamlessly with your Windows Media Center PC, allowing you to control your computer from up to 60 feet away.



Our Price **\$198** Save **\$72**
WebCode.....LOG3530

Logitech Cordless Desktop S 510

The perfect match with today's flat screen systems. Its innovative ultra-flat design is amazingly comfortable too. Integrated one-touch media and Internet controls include a music "Shuffle" key, instant image rotate and zooming.



Our Price **\$77** Save **\$22**
WebCode.....LOG3514

Logitech V400 Laser Cordless Mouse for Notebooks - Freerider Orange

The Logitech V400 Laser Cordless Mouse for Notebooks offers boundless mobility with an All-Terrain Laser™ sensor that tracks on even more surfaces. 2.4GHz Digital Cordless gives you a 5X stronger cordless connection, with no interference. Tilt Wheel Plus Zoom and programmable forward/backward buttons provide unprecedented control. A shock-resistant design and rubber side grips make the V400 ready for the road. USB. 3-year warranty.

- Track on more surfaces. Advanced dual laser technology provides pixel-precise tracking at home and on the go.
- Enjoy uninterrupted performance and 5X greater range—even in the busiest wireless environments. 2.4GHz Digital Cordless technology makes conventional wireless obsolete. Control your presentation from across the room!
- Work longer. The V400 turns off automatically when the Micro Receiver is stored inside, saving power. A battery indicator light lets you know when your battery is running low



Our Price **\$64** Save **\$26**
WebCode.....LOG3554

Logitech V100 Optical Mouse

The Logitech® V100 Optical Mouse for notebooks is far more comfortable than a touchpad and its contoured shape provides better support and more control than the touchpad. Use the tilt wheel to scroll side-to-side: perfect for viewing digital photos and spreadsheets. Click the wheel to instantly zoom in and out. USB. 3-year warranty.



Our Price **\$33** Save **\$7**
WebCode.....LOG3557

Logitech QuickCam Pro 5000

Designed to provide a more personal communication experience, the Logitech QuickCam Pro 5000's exclusive technologies ensure sharp video and clear audio. Logitech RightLight(TM) technology provides optimum video even in dim lighting while RightSound(TM) technology eliminates annoying echo and allows natural conversations.



Our Price **\$115** Save **\$34**
WebCode.....LOG3540

Q/C for Notebook Pro

Carry the QuickCam for Notebooks Pro in your pocket so you can bring instant messages to life, create and edit videos, capture high-quality photos, and more... no matter where you are! It attaches to your notebook computer with an integrated monitor clip, and includes a crush-resistant case for easy portability and storage.



Our Price **\$137** Save **\$43**
WebCode.....LOG3545

Logitech Ultra flat Keyboard

Delivers high performance and style in a sleek, compact design. Elegantly fusing form and function, this keyboard offers flatter, full-size keys in a very compact layout. Save space on your desk and streamline your work area without comfort sacrifice. Ideal to complement flat-screen monitors. Plug-and-play. USB and PS2.



Our Price **\$28** Save **\$10**
WebCode.....LOG3565

Logitech G3 Laser Mouse

With a 2000 dpi laser engine and full-speed USB, the G3 Laser Mouse delivers the highest gaming-grade performance in a ambidextrous design for precise fingertip control. Add to that low-friction polytetrafluoroethylene feet and DryGrip™ technology, this mouse is perfect for intense game play.



Our Price **\$58** Save **\$10**
WebCode.....LOG3571

Multimedia

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 3 Year Warranty

Canon Papers

- Canon 6 x 4" Glossy Photo
20 Sheet (CAN0103) **\$10**
- Canon 7 x 5" Glossy Photo
20 Sheet (CAN0162) **\$16**
- Canon A3 106gsm 20 Sheet
(CAN0111) **\$11**
- Canon A3 Photo Quality
165gsm (CAN0194) **\$26**
- Canon A3 245gsm
10 Sheet (CAN0113) **\$39**
- Canon A4 Glossy Photo
165gsm (CAN0173) **\$14**
- Canon A4 110gsm
200 Sheet (CAN0080) **\$35**

Epson Papers

- Epson 150 x 100, 50 Sheet
(EPA1735) **\$16**
- Epson 150 x 100, 50 Sheet
(EPA1729) **\$16**
- Epson 6 x 4" Glossy Photo
20 Pack (EPA1706) **\$10**
- Epson A3 Photo 20 Sheet
(EPA2007) **\$94**
- Epson A3 251gsm
20 Sheet (EPA2006) **\$119**
- Epson A4 245gsm
20 Sheet (EPA5065) **\$38**
- Epson A4 Double Sided
Matte 178gsm 50 Sheet
(APA5063) **\$34**

HP Papers

- HP A4 Semi Gloss 170gsm
100 Sheet (HPD2511) **\$23**
- HP A3 Laser Photo Glossy
200 Sheet (HPD6548) **\$66**
- HP A4 Semi Gloss 170gsm
40 Sheet (HPD2143) **\$16**
- HP A4 Laser Photo Glossy
200 Sheet (HPD6547) **\$44**
- HP A4 Laser Photo Matte
100 Sheet (HPD6550) **\$24**

Kodak Papers

- Kodak 4x6" Premium
Picture Paper 75 Sheet
(KOD7819) **\$40**
- Kodak A4 Pro 50 Sheet
(KOD2091) **\$55**
- Kodak A3 Pro 20 Sheet
(KOD2958) **\$62**
- Kodak Premium Photo
Paper A4 Ultra Glossy 20
Sheet (KOD5840) **\$16**
- Kodak 4x6" Prem Picture
Paper 25 Sheet
(KOD5793) **\$18**
- Kodak Pro Photo paper 50
sheet (KOD6031) **\$137**



Visit www.csw.com.au to view the complete range of media!



Now you can push the performance limits of CD writing - it's easy with 52x CD-R media from Verbatim. Tested and certified by leading 52x drive manufacturers.



Recognized as the choice for professional users, DataLifePlus DVD-R discs are based on an advanced "Metal Azo" recording dye, which provides the highest level of performance, reliability, and archival life.

Verbatim CD-R Optical Media

WebCode	Product Description	Price	SAVE
VBM1856	94935 Verbatim CD-R 80 Min Slim Case 10 Pk 52x	\$6	\$2
VBM1857	94611 Verbatim CD-R 80 Min Colours Slim Case 25 Pk 52x	\$18	\$2
VBM4961	94691 Verbatim CD-R 80 Min 50 Pk Spindle 52x	\$18	\$5
VBM4554	94554 Verbatim CD-R 80 Min Spindle 100 Pk 52x	\$36	\$5
VBM5005	95005 Verbatim CD-R 80 Min Silver IJ Printable 50 Pk 52x	\$18	\$5
VBM4190	41908 Verbatim CD-R 80 Min White IJ Printable 50 Pk 52x	\$23	\$1
VBM3133	43133 DataLifePlus CD-RW 80 Min Colour Slim Case 5 Pk 2x-4x	\$5	\$2

Verbatim DVD Optical Media

WebCode	Product Description	Price	SAVE
VBM0131	95165 Verbatim DVD-R DL 8.5GB Jewel Case 3 Pk 2-4x	\$16	\$3
VBM9510	95100 Verbatim DVD-R 4.7GB 10 Pk Spindle 16x	\$6	\$2
VBM0580	95058 Verbatim DVD-R 4.7GB 25Pk Spindle 16x	\$16	\$4
VBM1973	95137 Verbatim DVD-R 4.7GB White InkJet Printable 50 Pk 16x	\$34	\$4
VBM5014	95014 DataLifePlus DVD+R DL 8.5GB Jewel Case 3 Pk 2.4x	\$14	\$3
VBM4981	95123 DataLifePlus DVD+R DL 8.5GB IJ Printable 20Pk Spindle 2.4x	\$82	\$17
VBM5032	95032 DataLifePlus DVD+R 4.7GB Spindle 10 Pk 16x	\$8	\$1
VBM5033	95033 Verbatim DVD+R 4.7GB 25Pk Spindle 16x	\$14	\$9
VBM1974	95136 Verbatim DVD+R 4.7GB White InkJet Printable 50 Pk 16x	\$32	\$7
VBM1995	95145 Verbatim DVD+R 4.7GB White InkJet Printable 100 Pk 16x	\$64	\$14
VBM5043	95043 DataLifePlus DVD+RW 4.7 GB Jewel Case 5 Pk 4x	\$8	\$2
VBM5101	95101 DVD+R 4.7GB 16X Branded 50pk Spindle (not inkjet)	\$31	\$4
UBM5037	95037 DVD+R 4.7GB 16X Branded 50pk Spindle (not inkjet)	\$31	\$4

Click'n **Go** to get your business online

Already a well-known name in the domain name and web hosting market, Click'n Go is now able to offer businesses the total package to get them on the web easily at an affordable price

With Click 'n' Go, your getting all your online requirements from the one source. And you'll have our Support Team on hand to get things happening with a minimum of fuss.

Includes:

- Your own.au domain name
 - Up to 20 email addresses
 - Website hosting
 - Website builder tools
- and more**

Contact our Internal Sales Team
at sales@cs.w.com.au or
call 1300 658 600

Our Price **\$139** Save **\$10**
WebCode.....CL10001

This pack does not provide a connection to the Internet - please see your preferred Internet Service Provider (ISP) for connectivity solutions.

your own
.com.au
website
address

and
your own
business email
addresses

For just
\$139
Per Annum



Click'n Go!

Click'n Go!

Verbatim

See page 2 for details!
smart BUY club 3% rebate
Did you know that you can get up to 3% rebate on every order?
www.csw.com.au/smartbuy

Avid Liquid 7

Audio, DVD, Effects. One Application. Liquid's powerful SD and HD video editor offers integrated DVD authoring, surround sound audio processing and 1000s of powerful real-time effects. Liquid's integrated toolset provides all of the tools needed to create the highest quality productions and finish to tape, DVD or web streams.

Liquid 7 Pro
(PIN0133) **\$1597**

Liquid 7 DVDV
(PIN0132) **\$924**



Our Price **\$796**

Save **\$53**

WebCode.....PIN0131

Dvico Fusion HDTV DVB-T NANO

- Decoding and viewing of Digital Terrestrial Television
- USB 2.0 high speed compatible
- Supports all the formats of DVB-T/Australian AS4933 specification
- Supports DVB-T EPG
- Real Time Digital Video Recording(DVR) & Scheduled recording
- BDA drivers for 3rd party software
- Supports S/PDIF sound card output for home theatre users
- Recording stream cut-on-the-fly utility
- High resolution still image capture
- HD(MPEG2) to DVD/ MPEG4(Divx) conversion
- Convertible aspect ratio(16:9 or 4:3)
- Automatic and manual channel scan
- USB remote control included
- Time-shifting



Our Price **\$154**

Save **\$45**

WebCode.....DVC0019

TViX M-3100U

TViX is a standalone, multimedia hard disk player that plays digital videos, digital music, digital still photographs and DVD file to a TV or home entertainment system. This is a new way of enjoying digital content in the comfort of your own living room without having to burn discs and playing it back on a DVD or CD player. TViX performs just like a DVD player. Better still it doubles as a portable DVD movie library! Create your own home DVD movies and watch them as though they were playing back on a DVD player.



Our Price **\$294**

Save **\$26**

WebCode.....DVC0020

TViX HD M-5000U

Playback high definition video (up to 1920x1080i) and still images. Pre-recorded HDTV programs from a digital TV set-top box or personal digital video contents taken by a HDV™ camcorder can be played back with TViX HD on a high definition display. The TViX HD features a DVI connector and component, which matches the high resolution of HD level video contents



Our Price **\$597**

Save **\$53**

WebCode.....DVC0015

Dicota Keeper Mini

Keeper mini is the practical holder system for mobile phones and iPods. It can be easily mounted on the dashboard, the windshield surface or the middle console. Your mobile phone or iPod can be flexibly turned in all directions with the gooseneck and ball-point head (incl. receptacle and vacuum clip).



Our Price **\$51**

Save **\$9**

WebCode.....DIC0064

Kaiser Baas Photo Frames

The perfect complimentary product for digital cameras!

Show all your digital photos as slideshows with background music in these two contemporary design digital photo frames.

- Available in 5.6inch or 8inch LCD screens (viewable area)
- Easy-to-use menu screen with onboard buttons
- 32MB built-in memory
- Adjustable leg length
- Rotate, Zoom, Set Slideshow Duration
- Wall mount hole & tripod screw hole
- Infra-red remote control



5.6" Digital Photo Frame

Our Price **\$262**

Save **\$37**

WebCode.....KAB0001

8" Digital Photo Frame

Our Price **\$376**

Save **\$23**

WebCode.....KAB0002

Dicota Universal Travel Adapter

Cosmos Power solves your contact problems all around the world! The patented travel socket adapter has four power plug versions (EU, US, UK, AUS). A safe and easy way to connect your portable devices (Notebook, PDA, mobile phone, etc.) to an electrical outlet in more than 150 countries.



Our Price **\$33**

Save **\$12**

WebCode.....DIC0038

Dicota UltraSkin

UltraSkin from DICOTA is manufactured from special, shock-absorbing "memory-foam". The elastic protective cover fits like a glove. Any pressure possibly generated is deflected by the extraordinary "memory foam" (polyurethane foam), so that potential blows are absorbed. The foam regains its original form after the impact. The material is also water-repellent.



15.4" Version

Our Price **\$33**

Save **\$4**

WebCode.....DIC0063

Dicota BacPac Mission Pure Black

With the BacPac Mission, DICOTA has developed a comfortable notebook backpack with a modern and sporty design. Trendy features include rubber-surfaced, transparent zipper lashes as well as futuristic carabiner. For notebooks up to 360 x 280 x 50 mm



Our Price **\$79**

Save **\$20**

WebCode.....DIC0037

Synology DS-106e

- All-in-1 Home & SOHO Server
- Windows & Mac Cross-Platform Support
- UPnP Multimedia Server
- Download Station
- PHP+MySQL Web Station
- Photo Station
- File Server
- Printer Server
- Total Backup Solutions
- FTP Server
- USB UPS Support



Our Price **\$487**

Save **\$63**

WebCode.....SYN1003

Synology CS-406

- Cool and Quiet
- Small Footprint
- Windows & Mac Cross-Platform Support
- Windows ADS Support
- RAID Support
- User Quota
- Easy Assembly
- UPnP Multimedia Server
- Download Station
- PHP+MySQL Web Station
- Secure FTP Server over SSL/TLS
- Total Backup Solutions
- USB UPS Support



Our Price **\$1387**

Save **\$178**

WebCode.....SYN1006

Synology USB Station

- 3-in-1 SOHO Server
- Windows & Mac Cross-Platform Support
- External USB Disk Sharing
- FTP Support
- Large File Printing
- Share-level Protection
- PC Backup Program



Our Price **\$123**

Save **\$16**

WebCode.....SYN1002

Buying the latest IT Hardware?
Why not extend your warranty!
See page 2 for details!

UP TO
3 Year
Warranty

Belkin Kickstand Case for 5G iPod

This innovative Case for the stunning new 5G iPod helps you get the most from this new music marvel. The Case offers a snug fit with premiere quality leather construction to protect your iPod as you take it with you on the move. As with most Belkin iPod accessories, there is an unbeatable lifetime warranty to ensure your complete satisfaction.



Our Price \$29 **Save \$10**
WebCode.....BEL4068

Belkin Providence Street Laptop Bag, Koskin Leather

The Providence Street Koskin comes fully loaded, so you've got everything you need at hand! An external pocket for files, documents, newspapers, or any printed material you want accessible. For notebooks with 15" & 15.4" displays.



Our Price \$32 **Save \$27**
WebCode.....BEL8529

Belkin Wireless Calculator / Keypad with Wireless Mouse Bundle

The Wireless USB Mini Keypad with calculator and wireless mouse is finished, improved productivity and smart solution for spreadsheet, accounting and financial applications that require fast and accurate entry of numeric data. The wireless technology provides a free of cables workspace.



Our Price \$80 **Save \$19**
WebCode.....BEL2926

Belkin Flip

Share two computers with the click of a button. Flip lets you use one monitor, keyboard, and mouse with two computers. Now you can add a second computer or make use of your old computer in your home or office, and access both computers effortlessly from the same desk space. Flip eliminates the hassle of transferring files and programs between your old and new computer. Place the stylish remote anywhere on your desk, and press the button to flip your monitor from one computer to the next. It's that simple. Flip also lets you use one set of speakers for both computers. With full support for PC and Mac notebook and desktop computers, Flip can be used in any home or office.



Our Price \$84 **Save \$15** **Our Price \$84** **Save \$15**
WebCode.....BEL4254 WebCode.....BEL4253

Belkin Hi-Speed USB 2.0 4-Port Hub

This USB innovation from Belkin lets you connect up to four peripherals quickly and easily. Our Hi-Speed USB 2.0 4-Port Hub provides four downstream USB ports that offer Plug-and-Play connectivity to your USB 1.1 (low- and full-speed) and USB 2.0 (high-speed) devices. This includes such peripherals as scanners, printers, mass-storage drives, and high-resolution cameras. The Hub is self-powered and allows cascading-so that up to 127 USB devices may be connected to a single port.



Our Price \$50 **Save \$10**
WebCode.....BEL0329

Belkin USB 4-Port Micro Thumb Hub

The USB 4-Port Micro Hub from Belkin lets you connect up to four USB devices with easy, Plug-and-Play functionality-virtually anywhere you take your laptop. With USB connectivity, you get fast, reliable data transfers for a variety of devices. Its compact size and advanced functionality makes it the ideal accessory to include inside your laptop case-a great solution for today's mobile professional.



Our Price \$39 **Save \$10**
WebCode.....BEL0295

Belkin Optical Glow Mouse

The optical Glow mouse is a comfortable full-size optical mouse that combines functionality with a spectacular look. The special designed shape is ideal for left- and right-hand users and the 800 dpi sensor provides excellent optical precision. The multicoloured LED lights up your desktop area with changing colours and adds a little fun at work or at home. The mouse comes with a PS2 adapter, making this mouse suitable for both USB and PS2.



Our Price \$28 **Save \$12**
WebCode.....BEL2918

Belkin Home Series Surge Cube

The Home Series is perfect for entry-level computers, printers, ADSL modems, audio video, and everyday general household electronics. Offering up to 1034 Joules, AC/phone, fax/modem, cable-broadband protection, cable management, recessed sockets, and insulated pins, the Home Series comes with up to a \$75,000 Lifetime Connected Equipment Warranty.



Our Price \$23 **Save \$16**
WebCode.....BEL0245

SanDisk Ultra II

Action Photography. Professional Results.

- The SanDisk Ultra II cards are unbeatable and best-in-class:
- Write speed (mini) = 9MB/sec / Read speed (mini) = 10MB/sec
- Features high density flash memory and optimized controller technology lets you save large image files faster

Ultra II CF Card 1GB (SIM1002) \$62
Ultra II SD Card 1GB (SIM5987) \$58
Ultra II SD Plus 1GB (SAN0027) \$65

Ultra II Memory Stick Pro Duo 1GB (SAN0065) \$86

*Available in capacities up to 4.0GB



Our Price \$122 **Save \$22**
WebCode.....SIM0691

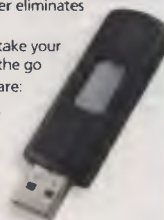
Our Price \$112 **Save \$17**
WebCode.....SIM0457

SanDisk Cruzer Micro

SanDisk Cruzer Micro new design is a small, smart and secure USB Flash Drive.

- Small, compact light weight design
- New Retractable USB slider eliminates the need for caps
- U3 smart enables you to take your portable applications on the go
- Preloaded with U3 software: CruzerSync, SignUpShield, SKYPE and AVAST

512MB (SAN0063) \$26
2GB (SAN0061) \$92
4GB (SAN0062) \$189



Our Price \$48 **Save \$11**
WebCode.....SAN0060

SanDisk Titanium U3

The New look Cruzer Titanium is fast, strong and unbeatable:

- Strong Liquidmetal casing crush resistant over 2,000lbs
- Retractable USB slider eliminates the need for caps
- Lightning speed of 15MB/s read speed & 9MB/s write speed
- U3 smart enables you to take your portable applications on the go
- Preloaded with U3 software: CruzerSync, SignUpShield, SKYPE and AVAST

2GB (SAN0069) \$110

Our Price \$59 **Save \$20**
WebCode.....SAN0068

SanDisk Cruzer Crossfire

SanDisk Cruzer Crossfire USB Flash Drive is specially designed to make your console or PC gaming experience portable.

- Compatible with any device with a USB port (PC, Xbox 360)
- Allows you to save your game data, view and store images, play your favourite videos and listen to digital music.
- Pre loaded gaming content Prince of Persia or CSI

512MB (SAN0039) \$26
1GB (SAN0040) \$48
4GB (SAN0070) \$176



Our Price \$92 **Save \$28**
WebCode.....SAN0067

Sandisk Cruzer Profile 1GB

SanDisk's Cruzer Profile provides the ultimate in data security:

- Fingerprint identification technology
- Added personal security capability to safeguard data and IE passwords
- Write speed (minimum) = 5MB/second / Read speed (minimum) = 8MB/second

512MB (SAN0024) \$35



Our Price \$66 **Save \$23**
WebCode.....SAN0026

M-Audio Studiophile BI-Amplified Studio Reference Monitors

- Two-way magnetically shielded studio reference monitors
- 70 watts of distributed power
- 5" Kevlar low-frequency drivers
- 1" natural silk high-frequency drivers
- XLR balanced and 1/4" balanced/unbalanced inputs



Our Price \$649 Save \$50

WebCode.....PWR0126

M-Audio Fast Track Pro 4x4 mobile USB Interface with preamps

- Mobile recording flexibility
- Balanced/unbalanced analog I/O
- S/PDIF coaxial; MIDI I/O
- 1/4" headphone output with level control and A/B source switch
- Mac and PC compatible; class compliant with Mac OS X 10.3.9 and higher



Our Price \$464 Save \$35

WebCode.....PWR0101

Epson Entry Level Multimedia Projector

- Native Resolution: 1024 x 768
- Projection System: RGB Liquid Crystal Shutter Projection System
- Brightness: 1800 ANSI Lumen
- Lamp Life: Up to 2000/3000 hours (Normal/Economic mode)
- Contrast Ratio: 500:1
- Weight: 2.6 Kg
- Noise Level: 30dB
- Image Size: 30" to 300"
- Input Terminals: 15 Pin D-Sub, S-Video, Composite (RCA), Mini Din



Our Price \$1127 Save \$176

WebCode.....EMP3003

Viewsonic Widescreen Multimedia Projector

- Native Resolution: 1024 x 768
- Projection System: Poly-Si TFT with Micro Lens
- Brightness: 2200 ANSI Lumen
- Lamp Life: Up to 2000/3000 hours (Normal/Economic mode)
- Contrast Ratio: 400:1
- Weight: 2.8 Kg
- Noise Level: <29/26 dB (normal / economic mode)
- Resolutions Supported: 640 x 400 to 1280 x 768
- Image Size: 30" to 300"
- Input Terminals: HDMI, 15 Pin D-Sub x 2, S-Video, Composite (RCA), USB, RS232



Our Price \$2563 Save \$436

WebCode.....VIE5005

M-Audio Podcast Factory Hardware & Software Bundle

- Everything you need to create professional sounding podcasts
- Professional 24-bit/48kHz audio interface
- dynamic broadcast microphone with desk stand
- Software for creating complete radio-style productions



Our Price \$325 Save \$24

WebCode.....PWR0119

M-Audio Delta 44 PCI Audio Card

Need a great sounding audio interface without digital I/O?

- 4 x 4 24-bit/96kHz full-duplex audio interface
- 4x4 analog I/O
- zero-latency monitoring
- Includes Ableton Live Lite 4 music production software



Our Price \$362 Save \$37

WebCode.....PWR0097

M-Audio Delta 1010 Digital Recording Studio

- 8 x 8 unbalanced analog I/O
- 2 built-in mic preamps
- 1 x 1 MIDI I/O
- iword clock I/O for sample accurate device synchronization solution for travelers and people on the move.
- S/PDIF digital I/O with PCM and AC-3/DTS surround



Our Price \$418 Save \$31

WebCode.....PWR0096

M-Audio Radium 61 key USB MIDI controller

Radium61 the most serious 5-octave keyboard

- 61 keys (+/-3 octaves)
- 8 assignable MIDI control knobs
- 8 assignable MIDI control sliders
- Built-in USB MIDI interface w/ 2 MIDI outs
- Includes Ableton Live Lite 4 music production software, so you can make music right away



Our Price \$464 Save \$35

WebCode.....PWR0122

BenQ Home Theatre Projector PE7700

- Native Resolution: WXGA (1280 x 720)
- Projection System: DLP™ by Texas Instruments
- Brightness: 1100 ANSI Lumen
- Lamp Life: Up to 2000/3000 hours (Normal/Economic mode)
- Contrast Ratio: 2500:1
- Weight: 5.5 kg
- Noise Level: <29/26 dB (normal / economic mode)
- Resolutions Supported: 640 x 400 to 1280 x 768
- Image Size: 37" to 300"
- Input Terminals: S-Video, Composite Video, BNC for PC/Component, HDMI, Component (RCA)



Our Price \$2547 Save \$252

WebCode.....BEN6023

Sony Cineza Widescreen Home Projector VPLHS60

- Native Resolution: 1280 x 720
- Projection System: 3 LCD panels with 1 lens
- Brightness: 1200 ANSI Lumen
- Lamp Life: Up to 2000/3000 hours (Normal/Economic mode)
- Contrast Ratio: 10000:1
- Weight: 5.6 Kg
- Noise Level: 23dB
- Image Size: 40" to 200"
- Input Terminals: HDMI, 15 Pin D-Sub, S-Video, Composite (RCA), 12v Mini Jack Trigger Input



Our Price \$3087 Save \$412

WebCode.....SNY0741

Century CD DVD Storage & Media Bundle

The best just got better! Includes a Century CD 100 disk Storage Unit, an add on 100 disc stacking unit for even more storage space and a spindle of 50 Excel DVD-R, 4.7GB, printable discs.



Our Price \$119 Save \$103

WebCode.....GDS0004

Century CD 100 Disk Storage Unit

The safe and convenient way to store, catalogue and retrieve your important data, photo memories and precious movies. Provides 100 disc capacity per CCD unit. Expandable to include 10 stacking units (1000 discs).



Our Price \$69 Save \$30

WebCode.....GDS0001

Century CD Add-on Unit

The safe and convenient way to store, catalogue and retrieve your important data, photo memories and precious movies. This vertical stacking add on version of the Century CD storage unit extends your storage capacity without taking up valuable desk space. Each unit stores 100 discs, up to 10 units can be stacked to store 1000 disks. Stacking units do not have power cords as the base unit provides the necessary power where each unit interlocks.



Our Price \$49 Save \$39

WebCode.....GDS0002

Multimedia

Buying the latest IT Hardware?
Why not extend your warranty!
See page 2 for details!

UP TO
5 Year
Warranty

Inventor Series

- Autodesk Inventor
- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)

AUTODESK INVENTOR PROFESSIONAL

Academic

Our Price **\$249** Save **\$26**

WebCode AUT0145

Revit Series

- Autodesk Revit
- AutoCAD

AUTODESK AutoCAD REVIT SERIES

Academic

Our Price **\$249** Save **\$26**

WebCode AUT0144

Autodesk Architectural Desktop 2007

- Autodesk Architectural Desktop
- VIZ Render

AUTODESK ARCHITECTURAL DESKTOP 2007

Academic

Our Price **\$259** Save **\$16**

WebCode AUT0133

AutoCAD, Autodesk Civil 3D and Autodesk VIZ student versions also available separately. See www.csw.com.au for more products!

AutoCAD 2007

Design, visualize, and document your ideas clearly and efficiently with AutoCAD software. From conceptual design through drafting and detailing, AutoCAD 2007 enables you to explore ideas like never before. Create, edit, and develop design alternatives using realistic solids and surfaces in an updated design environment. Communicate your ideas with powerful sketch, shadow, and rendering tools, including intuitive walk-through animations. Then turn your concepts into a set of documents with the new section and flatten functionality. It's all here, whether you're creating, exploring, managing, or communicating. AutoCAD keeps you on time, on budget, and on track.

Important Announcement for AutoCAD customers:
AutoCAD Upgrades are now only available through the new subscription program.

AutoCAD Subscription pricing available on application

Exclusive Offer!
Purchase a new seat of AutoCAD and receive a bonus - Navman iCN320 valued at \$499 Offer available for a limited time only.

*Bonus only available to full version and only while stocks last!

AutoCAD LT 2007

Enhance your productivity with AutoCAD LT software, the world's number one-selling drafting and detailing product. AutoCAD LT 2007 is better than ever. Blocks are now dynamic, Express Tools for better layer management were added, and drafting enhancements abound. Now the tasks you perform every day are streamlined with just one thing in mind—boosting productivity. With full DWG file format compatibility, and access to attached drawings, you've never experienced a more efficient design process.

AutoCAD LT Subscription also available, price on application.

AutoCAD LT 2007

HOT PRICE

Our Price **\$829** Save **\$70**

WebCode AUT0116

Full Version

Our Price **\$1993** Save **\$207**

WebCode AUT0115

Autodesk Design Review 2007

Accelerate design reviews with Autodesk Design Review 2007, the all-digital way to review, mark up, and revise 2D and 3D designs. View and print DWG and DWF files with accuracy and fidelity, then measure and annotate the DWF file before round-tripping the markups for revisions. Cycle times, errors, and costs will shrink. Efficiency, however, will soar.

- Upgrade from DWF or Volo (AUT0132) **\$179**
- 5 User Pack (AUT0129) **\$1489**
- 10 User Pack (AUT0130) **\$2865**
- 25 User Pack (AUT0131) **\$6945**

AUTODESK DESIGN REVIEW 2007

Our Price **\$335** Save **\$22**

WebCode AUT0128

Exclusive Offer for all AutoCAD LT Users

Cross-grade your AutoCAD LT to AutoCAD 2007 and save up to 50%

OFFER 1:

AutoCAD LT 2004 to LT 2007

Our Price **\$3299** Save **\$276**

WebCode AUT0148

(pricing includes one year subscription)

OFFER 2:

AutoCAD LT 2000 to LT 2002

Our Price **\$3499** Save **\$351**

WebCode AUT0147

(pricing includes one year subscription)

*Offer available to all registered LT users. Not valid for LTs purchased after 21st July 2006. Pricing includes one year subscription.

AutoSketch 9

AutoSketch 9 software provides a comprehensive set of CAD tools for creating precision drawings—from electrical details to floor plans, from conceptual sketches to product specifications, and much more. Offers straightforward drafting in a Windows XP-like environment plus tutorials and wizards for a fast start.

AutoSketch 9

Our Price **\$220** Save **\$22**

WebCode AUT0077

CorelDRAW Graphics Suite X3

Streamline your workflow with one complete package

Corel Draw Graphics Suite X3 is trusted by busy designers and business users to transform ideas into professional results – fast! With this comprehensive graphics suite, users can confidently tackle a wide variety of projects – from logo creation and web graphics, to multi-page marketing brochures, or eye-catching signs. Now with enhanced illustration, page layout, photo editing, powerful bitmap-to-vector tracing, and helpful new learning tools, this integrated graphics suite delivers the ultimate combination of superior design capabilities, speed, ease-of-use and affordability that cannot be matched by any other graphics software.

BONUS Mouse valued at \$50*



Technology & Business
Magazine,
February 2006



* Available via redemption only while stocks last.
For more details see www.csw.com.au/promotions for more details

Full Version	Upgrade	Academic
Our Price \$629 Save \$120	Our Price \$275 Save \$74	Our Price \$149 Save \$30
WebCode COR8333	WebCode COR8325	WebCode COR8327

Corel Wordperfect Office X3 — Standard Edition

Work easily, creatively and securely

Get everything you expect in an office suite and more! includes powerful word processing, versatile spreadsheets, multimedia presentations and new email with lightning fast searching. Open, edit and save Microsoft Word, Excel and PowerPoint files, and PDFs. Create professional looking documents and presentations easily and quickly. Search the Web and access online tutorials right from WordPerfect X3. It's so easy to use, you can get started right away – even if you're new to WordPerfect Office! Trusted by millions. More affordable than MS Office. It's the office suite that makes perfect sense.

Work with Microsoft Office users:

- Open, edit and create Microsoft Word, Excel and Powerpoint documents*.
- Create & Edit PDFs without any additional software.

Work with other applications:

- Open over 150 different file formats!
- Includes Getting Started with WordPerfect Office X3, FREE training CD from lynda.com.

* Corel WordPerfect Office X3 will open the majority of files created in Microsoft Word, Excel and PowerPoint.

Upgrade	Student & Teacher Edition	Standard Edition
Our Price \$245 Save \$44	Our Price \$149 Save \$40	Our Price \$449 Save \$120
WebCode COR8326	WebCode COR8328	WebCode COR8323



Corel WordPerfect Office X3 — Home Edition

Work easily, creatively and securely on your home computer

Built for the way you use your home computer, includes easy-to-use software for word processing, spreadsheets, photo and video editing, CD burning, internet security, and more! With WordPerfect Office X3 – Home Edition, you can open, edit and create Microsoft Office files, making it easy to share information. Plus, you can express yourself creatively, work, play, and get things done with one complete suite. WordPerfect Office X3 – Home Edition is priced for a family budget. See for yourself why millions of people depend on WordPerfect Office.

Includes 8 essential products from Corel, Pinnacle & Symantec*:

- 1 WordPerfect X3 – Home Edition: Legendary word-processing power.
- 2 Corel Photo Album 6 Standard Edition: The easiest way to manage your photos.
- 3 Pinnacle Studio SE: Powerful home video editing made simple.
- 4 Norton Internet Security 2006*: The most trusted Internet security software.
- 5 Quattro Pro X3 – Home Edition: Versatile spreadsheets.
- 6 Pinnacle Instant CD/DVD LE v8: Complete CD/DVD burning collection.
- 7 OfficeReady Personal Finance Essentials: Plan for your financial future. includes 85 templates
- 8 Home and School Essentials: Save time with 50 home and school project templates

* Norton Internet Security 2006 the world's most trusted internet security solution and a complimentary 90-day subscription to protection updates



Home Edition
Our Price \$159 Save \$35
WebCode COR8324

Corel Paint Shop Pro X

The easiest way to turn your pictures into professional looking photos – fast!

Corel Paint Shop Pro X delivers a complete set of photo editing tools to help you create professional-looking photos fast! With Paint Shop Pro X you can fix brightness, colour and photo imperfections; compose photos full of depth and imagination; give photos a unique and exciting look, plus, organise and share all your photos with Corel Photo Album 6 – Standard Edition. By combining automatic photo fixes, precision editing controls in a revolutionary Learning Center with organising features, Paint Shop Pro is a first of its kind – and easy-to-use photo editor for anyone who wants to create stunning photos right out of the box.

BONUS Mouse valued at \$50*



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Choice November 2005



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PC User,
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* Available via redemption only while stocks last.
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Full Version	Upgrade	Academic
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WebCode JAS0034	WebCode JAS0035	WebCode JAS0036

Corel Photo Album 6

Corel Photo Album 6 is the most complete and easy-to-use digital photo software. With smart and simple tools that automate everything from download to print, and stunning creative projects, Corel Photo Album 6 is the best way to bring photo collections to life.



Full Version
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WebCode JAS0038

Corel Painter IX.5 Academic

Features digital brushes, art materials & textures that mirror the look & feel of traditional tools. Take digital design to new levels with the Artists' Oils Painting System, Snap-to-Path Painting, Quick Clone and brushes that perform faster than previously.

Full (COR8600) **\$625**
Upgrade (COR8601) **\$363**



Academic
Our Price \$154 Save \$45
WebCode COR8602

Corel Painter Essentials 3

A complete home digital art studio that helps you turn photos into stunning paintings. Capture your special memories with beautiful, hand-made digital art keepsakes, perfect for sharing with friends and family, and for framing. It's never been easier to learn how to draw and paint, with the included video training and tutorials.



Full Version
Our Price \$154 Save \$45
WebCode COR8683

Design & Publishing

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Total Training Adobe Design Bundle

Get all of the training a creative professional needs with this combination of comprehensive lessons on Macromedia Flash Professional 8 and the Adobe Creative Suite 2 Premium product lines.



Training DVD
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WebCode.....TOT0037

Total Training Adobe Creative Suite 2: From Design to Delivery

Uncover valuable techniques to maximize your creative print and web design work flow by understanding how the Creative Suite 2 products work together to create impressive design projects.



Training DVD
Our Price **\$176** Save **\$23**
WebCode.....TOT0030

Total Training for Adobe Acrobat 7 Professional

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Training DVD
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WebCode.....TOT0008

Studio 8

Studio 8 is the essential software suite used to design, develop and maintain interactive online experiences. With latest releases of Dreamweaver, Flash Professional, Fireworks, Contribute and FlashPaper, Studio 8 offers web designers and developers a new level of expressiveness, efficiency and simplified workflow to create websites, interactive experiences and mobile content.

Studio 8 offers

- All the tools in one complete suite
- Advanced design tools to create, edit, optimize and customize interactive content
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- New Contribute web content management tools to keep websites fresh and resources focused
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- Easiest way to add interactive video to websites and presentations
- Efficient integration and round-tripping across products
- Streamlined workflow with third party technologies and products

Why Studio

Get the complete toolset.

Studio 8 is the must-have suite for start-to-finish design, development and maintenance of websites, applications, games, interactive presentations, and mobile content.

Express creativity.

Studio 8 offers the broadest range of creative tools for expressiveness and creation of vibrant interactive media, websites, or applications. Use advanced graphics, text, animation, video, and audio tools with precision control and quality.



Upgrade
Our Price **\$608** Save **\$153**
WebCode.....ALG0087

Academic
Our Price **\$429** Save **\$108**
WebCode.....AEP1026

Full
Our Price **\$1434** Save **\$357**
WebCode.....ALD0036

Adobe Design Bundle

The Adobe Design Bundle offers the unified design environment of Adobe Creative Suite 2 Premium software with Macromedia® Flash® Professional 8 software, the industry's choice for creating advanced interactive content. Now with one package, you can design, develop, manage, and deliver a consistent experience using industry standards such as Adobe PDF and Macromedia Flash format—to millions of people around the world in print, on the web, and on mobile devices.

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- Adobe InDesign® CS2
- Adobe GoLive® CS2
- Adobe Acrobat® 7.0 Professional
- Version Cue® CS2
- Adobe Bridge, and
- Adobe Stock Photos

Macromedia Flash Professional 8 Get the best of both Worlds



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WebCode Mac.....ALG0062
WebCode Win.....ALG0064

Adobe Design Bundle Full
Our Price **\$2272** Save **\$868**
WebCode Mac.....ALD0010
WebCode Win.....ALD0012

Fireworks 8

Robust professional tools let you create, edit, and animate graphics, add advanced interactivity and optimize images in an accessible environment.

Get top quality design results.

Take creative control with seamless vector and bitmap editing in an integrated environment. Fireworks automatically responds to tool selections, transitioning smoothly between modes.

Upgrade (ALG0068) **\$225**



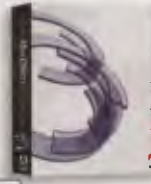
Full
Our Price **\$423** Save **\$170**
WebCode.....ALD9578

After Effects 7.0 Pro

Adobe After Effects 7.0 software helps you create compelling motion graphics and blockbuster visual effects with efficiency, precision, and infinite variety. Bring a new dimension to your film, video, DVD, and Macromedia Flash productions.

Pro Academic
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Win (AEP9506) **\$444**

Pro Upgrade
Mac (ALG0090) **\$299**
Mac (ALG0088) **\$299**



Professional
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WebCode Mac.....ALO0038
WebCode Win.....ALO0037

Dreamweaver 8

Dreamweaver 8 is the industry leading web development tool, enabling users to efficiently design, develop and maintain standards based websites and web applications. Web developers go from start to finish, creating and maintaining websites to advanced applications that support best practices and the latest technologies.

Academic (AEP1010) **\$286**
Upgrade (ALG0067) **\$299**



Full
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WebCode.....ALD0014

Flash Professional 8

Introducing Macromedia's biggest Flash release to date, Flash Professional 8 is the industry's most advanced authoring environment for creating interactive websites, digital experiences and mobile content.

Academic (AEP1014) **\$365**
Upgrade (ALG0072) **\$450**
Flash Basic (ALD0016) **\$586**



Full
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WebCode.....ALD0020

Adobe Creative Suite 2

Adobe Creative Suite 2 is a unified design environment that delivers the next level of integration in creative software. New features and tighter integration among suite components simplify creative and production tasks, enabling you to work more efficiently than ever before. Version Cue CS2 includes enhancements in file versioning and review management, while other new features like Adobe Bridge, Adobe Stock Photos, color consistency, and unified Adobe PDF file creation offer greater productivity and collaboration.

In today's fast-paced world, it is your ideas that will make the difference — and capturing and communicating those ideas with simplicity and power are more important than ever. To succeed, you need solutions that bring that same level of simplicity and power to your workflow. Bring all of your ideas to life with the industry's most complete suite of integrated design software.

Includes:

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- Adobe InDesign CS2 (Page layout)
- Adobe GoLive CS2 (Web design)
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- Version Cue CS2 (File sharing and versioning)
- Adobe Bridge (File browsing and organizing)
- Adobe Stock Photos (Royalty-free images)

CS2 Standard **\$1449**

CS2 Standard Upg **\$575**



CS 2 Premium		CS 2 Premium Upg		CS 2 Premium PS Upg		CS 2 Premium Academic	
Our Price	\$1898	Save \$552		Our Price	\$893	Save \$304	
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Adobe Web Bundle

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Web Bundle Upg **\$1386**

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Our Price	\$2727
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WebCode Mac	ALD0009
WebCode Win	ALD0011

Adobe Photoshop CS2

Adobe Photoshop CS2 software, the professional image-editing standard and leader of the Photoshop digital imaging line, delivers groundbreaking creative tools; unprecedented adaptability; and more efficient editing, processing, and file handling.

Adobe Photoshop CS2 Upgrade **\$308**

Adobe Photoshop CS2 Academic **\$418**



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Our Price	\$1052
Save	\$398
WebCode Mac	ALD9552
WebCode Win	ALD9553

Adobe Illustrator CS2

Adobe Illustrator CS2 software gives you powerful new creative options, easier access to tools, and the versatility to quickly produce flexible graphics for print, video, the Web, and mobile devices.

Adobe Illustrator CS2 Upgrade **\$286**

Adobe Illustrator CS2 Academic **\$147**



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WebCode Win	ALD9551

Adobe InDesign CS2

Join the growing ranks of creative professionals discovering new levels of creative freedom and productivity using Adobe InDesign CS2 software. Tightly integrated with the Adobe applications you use most, InDesign CS2 delivers faster production workflows and a more fluid creative environment for designing professional layouts with sophisticated graphics and typography.

InDesign CS2 Upg **\$295**

InDesign CS2 Academic **\$265**



Full	
Our Price	\$1155
Save	\$368
WebCode Mac	ALD0476
WebCode Win	ALD0477

Adobe GoLive CS2

Unlock the power of CSS with intuitive visual tools, easily take your existing Adobe design assets to the Web, and build and manage Web and mobile sites using the advanced, standards-based coding environment in Adobe GoLive CS2 software.

Adobe GoLive CS2 Upg **\$295**

Adobe GoLive Academic **\$121**



Full	
Our Price	\$682
Save	\$195
WebCode Mac	ALD9548
WebCode Win	ALD9549

Adobe Acrobat 7.0 Professional

Adobe Acrobat 7.0 Professional software is the advanced way to create, control, and deliver more secure, high-quality Adobe PDF documents.

Professional 7.0 Upg **\$249**

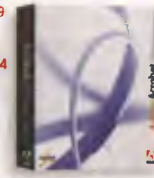
Pro. 7.0 Upg Std **\$249**

Professional 7 Academic **\$204**

Standard **\$459**

Standard Upg **\$152**

Standard Academic **\$132**



Full	
Our Price	\$679
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WebCode Mac	ALD9526
WebCode Win	ALD9527

Photoshop Elements 4.0 and Premiere Elements 2.0 Classroom

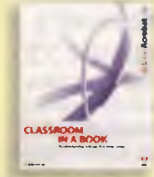
Classroom in a Book, the best-selling series of hands-on software training workbooks, helps you learn the features of Adobe software quickly and easily.



Book	
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WebCode	PGN0266

Adobe Acrobat 7 Classroom in A Book

Adobe has brought the classroom to you in this handy volume, completely revised to cover all that's new and different in Acrobat 7. Through a series of self-paced lessons (each of which builds on the last and includes hands-on projects that the you can create using the files on the accompanying CD-ROM).



Book	
Our Price	\$52
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WebCode	PGN0134

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A full-color cookbook of ideas, with step-by-step instructions for creating way-out, fun effects for photography, Web design, and commercial art. Among nearly 50 effects presented are type, lighting, and photographic effects, photo manipulations, visual puns, art styles, and wild backgrounds. Shows the reader how to dive into the fun stuff, without a lot of text and theory.



Book	
Our Price	\$39
Save	\$15
WebCode	WIL0065

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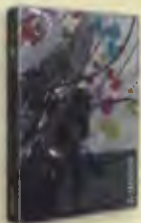
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3D Studio Max is the must-have 3D modeling, animation, and rendering solution for demanding artists, schools, and production environments. Available with a 2 year licence for students, 3D Studio Max offers powerful creative workflow tools, including the most comprehensive advanced character animation toolset currently available with acclaimed visual effects and support for next-generation production environments.



Our Price **\$269** Save **\$30**
WebCode.....AUT0107

Incomedia Website X5

Create your own stunning website without knowing HTML 5 easy steps!

WebSite X5 is a completely visual software: it does not require any HTML programming skills and it is the ideal tool for both home users and Web Designers.

If you have a project in mind, a personal or company site, a digital photo album or an interactive presentation, WebSite X5 allows you in only 5 steps to pass from a simple idea to a complete and working website, already published and perfectly visible on the Web.



Our Price **\$99** Save **\$10**
WebCode.....INC0001

QuarkXPress 7

The industry-leading software for design and layout

QuarkXPress 7 is a tool that will give you amazing creativity and rock-solid productivity. Industry experts are united in calling QuarkXPress 7 one of the most significant upgrades the application has ever seen. Much more than a page layout tool, QuarkXPress provides proven performance with graphics and colour management text processing, Web-page design, XML output and more!

QuarkXPress is powerful layout software with an intuitive, versatile interface that lets you combine writing, editing, and typography with colour and pictures to produce dynamic final output. QuarkXPress is widely used by magazines, newspapers, advertising agencies, typesetters, printers, corporate publishers, design firms, catalogue houses, book publishers, and form designers. It is also used by businesses with publishing requirements.

New features include:

What's hot for designers & layout professionals:

- Transparency and drop shadows
- Composition zones
- New measurement palette
- Unicode and OpenType
- Enhanced picture effects and Adobe Photoshop integration
- Quark job jackets
- Shared content
- Tables enhancements

What's hot for print service providers:

- PDF/X
- Output styles
- PPML output
- Redesigned colour manager
- Quark job jackets



Our Price **\$235** Save **\$14**
WebCode Mac.....QUA0045
WebCode Win.....QUA0044

Version 7 Upgrade
Our Price **\$565** Save **\$85**
WebCode Mac.....QUA0042
WebCode Win.....QUA0043

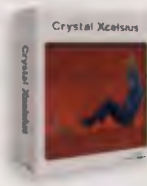
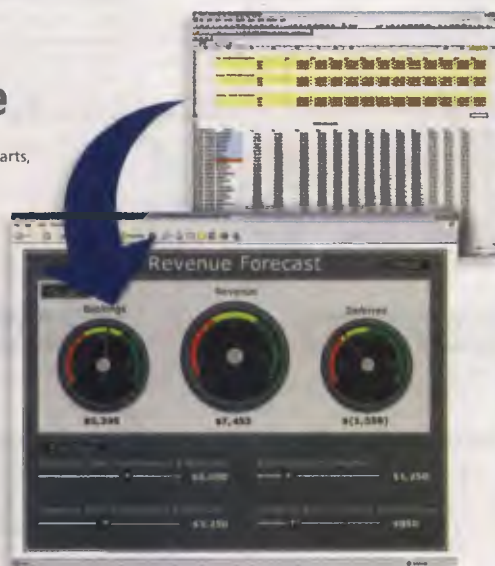
Version 7 Full
Our Price **\$1647** Save **\$148**
WebCode Mac.....QUA0040
WebCode Win.....QUA0041

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Dragon Naturally Speaking 9 Preferred Edition

Dragon NaturallySpeaking Preferred 9 gives small business and advanced PC users the power to create documents, reports, emails and more - all by speaking! Fast, easy and amazingly accurate, it's over three times faster than typing. No script reading required to get started! Just use your voice to dictate and edit in any Windows application. You can even dictate into a handheld device when you're away from your PC, or use a Bluetooth microphone! Browse, search and navigate the Web just by talking! Listen to incoming email and documents read aloud. A Nuance-approved noise-cancelling microphone is included.



Full
Our Price **\$330** Save **\$69**
WebCode: NUA0017

Nuance PaperPort 11

PaperPort 11 is the easiest way to turn piles of paper & photos into organised PDF and JPEG files. PaperPort produces perfect scans with the push of a button. Your documents are displayed as thumbnails on a unique visual desktop for fast browsing. End the frustration of looking for paper or digital documents by searching for words inside your files, with the exclusive all-in-one search. Save time and know that important documents and photos will never be lost. PaperPort is perfect for your home or small office.

Academic (NUA0013) **\$150**
5 User (NUA0011) **\$790**



Full
Our Price **\$165** Save **\$34**
WebCode: NUA0009

Nuance PaperPort Professional 11

PaperPort Professional 11 is the most productive way to scan, organise, find & share photos, paper & digital documents. PaperPort Pro combines the efficiency of document management with the convenience of perfectly scanned documents and the power of creating PDF files, to bring a new level of proficiency to your business. The visual document desktop allows you to browse and assemble documents with drag-and-drop ease. Millions of people, including office workers and business professionals, rely on PaperPort to streamline their work.

Academic (NUA0015) **\$280**
5 User (NUA0012) **\$1500**



Full
Our Price **\$330** Save **\$69**
WebCode: NUA0010

Nuance PDF Create! 3

The fast, reliable and affordable way to turn all of your PC documents, drawings and images into industry-standard PDF files. Instantly create PDF's that are compact, easy to e-mail, printable and can be viewed on the Web. PDF Create! also provides all of the advanced features you need, including compressed file sizes, password security, 128-bit encryption, batch conversion of multiple files at time, watermarks, bookmarks, hyperlinks and more.

Features include:
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• Reduced and optimised file sizes
• International language support

Academic (SCA0056) **\$69**



Full
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WebCode: SCA0030

Nuance PDF Converter 3 Professional

The complete PDF solution for business users offers an unmatched combination of creation, conversion, and editing, plus commenting and security features to give total document control and maximum efficiency. Now you can edit directly within a PDF file - just like working in the original file. Standard PDF forms can be instantly converted into fillable PDF forms. Also features new mark-up and commenting tools & cutting edge security features. Less than a third the price of other PDF software and you truly have a cost effective PDF powerhouse!

Academic (NUA0002) **\$83**



Full
Our Price **\$156** Save **\$39**
WebCode: SCA0039

Nuance OmniPage 15

The latest version of the world's best-selling OCR software, is the most precise way to convert paper and PDF files into your favourite PC applications. Powerful new OCR technology, advanced layout analysis and intuitive editing tools allow you to quickly turn paper and PDF files into editable electronic documents that look just like the original - complete with text, tables and graphics. Not only is OmniPage more than 99% accurate, its improved speed and intuitive proofing combine to make document conversion faster and easier than you could imagine.

Academic (SCA0049) **\$225**



Full
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WebCode: SCA0044

Nuance OmniPage 15 Professional

The latest version of the world's best selling OCR software, is the most precise way to convert documents and forms into your favorite PC applications. Powerful new OCR engines combine with advanced workflow technology to automate all your conversion needs. Whether you want to make paper digital, convert Quark files to MS Word, or create batches of PDF files, OmniPage 15 Professional is up to the task with superior accuracy (up to 99%) and formatting. Convert, edit, archive and share all your paper and PDF documents.

Upgrade (SCA0046) **\$330**
Academic (SCA0050) **\$695**



Full
Our Price **\$825** Save **\$174**
WebCode: SCA0045

Nuance Dragon Naturally Speaking 9 Mobile Edition

For the busy professional moving between clients, home and the office, flexibility is a must. The new Dragon Naturally Speaking Mobile solution lets you dictate documents and notes on the move. Back in the office simply plug the recorder into the PC, transfer your file and let Dragon Naturally Speaking Preferred automatically transcribe your dictation. No need to rely on manual transcription - saving you time and money! Dragon Naturally Speaking Mobile delivers the performance that mobile professionals demand. It includes the Dragon Naturally Speaking 9 Preferred software, Phillips digital recorder, special linking software and a high-quality headset microphone.



Full
Our Price **\$620** Save **\$129**
WebCode: NUA0016

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This Edition is the network operating system for small organisations and departmental use. It delivers intelligent file and printer sharing, secure Internet connectivity, centralised desktop application deployment, and Web solutions.

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Std 10 Client R2 Edu
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WebCode.....MSS0060

MS Project Standard

The new version of Microsoft's core project management program. With familiar, easy-to-use tools, Project Standard enables business managers to manage projects independently from their desktop.

Upgrade (MSA2054) \$530
Full (MSA2053) \$919



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Academic*
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MS Project Professional

The enterprise project management program, works along with Project Server 2003 and Project Web Access to help you more effectively plan projects, better manage resources, and establish organization-wide repeatable processes.

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Full (MSA2056) \$1535



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Our Price \$287 Save \$22
WebCode.....MSA2055

One Note 2003

OneNote 2003 replaces the need for a pad and pencil. Capture, organise and access notes on your laptop, desktop or Tablet PC. Record voice in a meeting and use OneNote to mark each new topic of conversation.

Academic (MSA4227) \$75



Our Price \$145 Save \$12
WebCode.....MSA4228

Microsoft Visio 2003 Pro

Microsoft Office Visio Professional 2003 includes a full range of diagrams for business and technical professionals to create network and directory service diagrams, software, database, website diagrams, engineering drawings and building space and floor plans.

Pro Upgrade
(MSA4242) \$385
Full (MSA4241) \$759



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Academic*
Our Price \$215 Save \$30
WebCode.....MSA4240

Microsoft Visio 2003 Std

Microsoft Office Visio 2003 gives business and technical users the power to visualise and communicate ideas, information, and systems. Use the simple, flexible tools in Visio 2003 to easily create business and technical charts and graphics that capture your inspiration and communicate it with impact.

Standard Upgrade
(MSA4245) \$154
Full (MSA4244) \$308



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Our Price \$97 Save \$11
WebCode.....MSA4243

Microsoft FrontPage 2003

Use enhanced design tools to produce better looking Web sites. Generate better code, or expand your code skills. Use built-in scripting tools for interactive results. And with professional coding tools, you can write code faster, more efficiently, and with greater accuracy. Connect with people and information in new ways by building Extensible Markup Language (XML) data-driven Web sites.

Upgrade (MSA4217) \$165
Full (MSA4216) \$319



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Academic*
Our Price \$148 Save \$11
WebCode.....MSA4215

Microsoft Publisher 2003

Publisher 2003 is a comprehensive solution for creating and publishing a wide variety of publications for desktop printing, commercial printing, e-mail distribution, or viewing on the Web. Publisher 2003 looks and works more like other programs in the Microsoft Office System, making it easier to use the right Office tool for the task.

Upgrade (MSA4235) \$155
Full (MSA4234) \$269



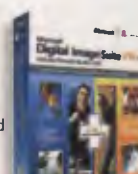
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Microsoft® Digital Image Suite Plus 2006

Complete photo + video organisation, editing and sharing

- Combines Microsoft Digital Image Suite and Pinnacle Studio software
- Organise and find photos and videos quicker and easier than ever!
- Creatively edit and improve your videos and photos with ease.
- Share your memories with anyone you want by burning movies, photos and slideshows on DVD, VCD or CD-ROM.



Our Price \$154 Save \$45
WebCode.....MSC2929

Visual Studio 2005 Professional Edition

The comprehensive tool for developers working alone or in small teams to deliver the full range of applications on the Microsoft platform. Intuitive and powerful, Visual Studio Professional 2005 speeds the development, debugging and deployment of applications for Windows, the Web, and mobile devices.

- Easily create and deploy client applications. Automatically publish and maintain applications and their dependencies with integrated ClickOnce support.
- Build fast, interactive Web applications. Take advantage of more than 50 new controls and hundreds of built-in services for site security, personalization, look and feel, and more.
- Develop faster with enhanced visual designers and editors. Streamline development of all tiers of your application and improve XML editing and XSLT debugging with intuitive visual designers.
- Create dynamic, data-enabled applications. Quickly create data-driven applications using an integrated data access, design, and reporting environment.
- Take advantage of a powerful, enterprise-class application platform.
- Tackle any development task. Create robust applications using the Microsoft® .NET Framework 2.0, the .NET Compact Framework 2.0, and native code-all supported by Microsoft Visual Studio® 2005.

Standard Academic (MSA9848) \$149



Professional Edition	Professional Edition Upgrade	Standard	Standard Upgrade
Our Price \$1285 Save \$102	Our Price \$875 Save \$70	Our Price \$472 Save \$36	Our Price \$313 Save \$24
WebCode.....MSA9846	WebCode.....MSA9847	WebCode.....MSA9849	WebCode.....MSA9850

SQL Server 2005

SQL Server 2005 is Microsoft's next generation data management and analysis solution that will deliver increased security, scalability, and availability to enterprise data and analytical applications while making them easier to create, deploy, and manage.

- SQL Server 2005 provides the highest productivity for developers building data-driven applications. SQL Server 2005 enables IT professionals to focus on high value tasks by reducing time spent on development, routine operations and management.
- A comprehensive business intelligence platform, with an integrated environment for data integration, analysis, and reporting. Enables organizations to better use insight for enhanced decision making.
- An enterprise-grade database platform that is ready to run the most demanding mission critical applications, with proven performance for some of the world's largest data warehousing and OLTP systems.
- Enables you to confidently deliver highly reliable, available applications to your employees. Provides enterprise scalability allowing you to quickly build and deploy demanding applications. Delivers advanced capabilities to help you secure your organizations' information assets.



Workgroup 5 User	Workgroup 5 User Academic	Standard 5 User	Standard 5 User Academic
Our Price \$1262 Save \$114	Our Price \$684 Save \$34	Our Price \$2947 Save \$267	Our Price \$1049 Save \$52
WebCode.....MSS8256	WebCode.....MSS8254	WebCode.....MSS8247	WebCode.....MSS8245

See page 2 for details
SMART BUY club
3% rebate

Did you know that you can get up to 3% rebate on every order? www.csw.com.au/smartbuy



*Limited stock at this price!

Why get MS Office 2003?

Microsoft Office 2003 Editions deliver significant improvements over previous versions of Office, including:

- Advanced e-mail management tools to help you fight back against spam and viruses better than ever before.
- Improved automatic document recovery and compatibility with older files, which mean fewer worries about lost data.
- Brand-new collaboration features to allow you to share work easily and stay connected anytime, anywhere.

MS Office 2003 Editions work best with Windows XP

- If you use Windows XP or Windows 2000, then Office 2003 is the right choice for you.

- If you use Windows 98 or Windows Me, you should consider upgrading to Windows XP.

- If upgrading to Windows XP is not an option for you, then Office XP is the best way to go.

*Price drops are strictly limited quantities, for a limited time only!
Price drops valid from 1st January 2006 to 31st March 2006.

Pro Edition Academic*
Our Price **\$234** Save **\$65**
WebCode.....MSA4222

Office	Student & Teacher Edition*	Standard Edition	Small Business Edition	Professional Edition
Word	•	•	•	•
Excel	•	•	•	•
PowerPoint	•	•	•	•
Outlook	•	•	•	•
Outlook with Contact Manager			•	•
Publisher			•	•
Access				•
Enhanced XML Technology				•
Enhanced IRM Technology				•

*For non-commercial use only. Must be a "Qualified Educational User." See Student and Teacher Edition 2003 package for details.

Standard Edition Upgrade
Our Price **\$359** Save **\$65**
WebCode.....MSA4221

Standard Edition Full
Our Price **\$593** Save **\$82**
WebCode.....MSA4220

Small Business Upgrade
Our Price **\$418** Save **\$81**
WebCode.....MSA4226

Small Business Full
Our Price **\$665** Save **\$84**
WebCode.....MSA4225

*for non-commercial use only

Student & Teacher Edition*
Our Price **\$204** Save **\$45**
WebCode.....MSA4237

Pro Edition Upgrade
Our Price **\$488** Save **\$86**
WebCode.....MSA4224

Pro Edition Full
Our Price **\$727** Save **\$122**
WebCode.....MSA4223

Office 2004 for Mac

Office 2004 for Mac gives you all the leading presentation, spreadsheet, word processing, and e-mail software Edition in one convenient, specially priced package.

Standard (MSA3747) **\$572**

Upgrade (MSA3748) **\$341**



*for non-commercial use only

Student & Teacher Version
Our Price **\$220** Save **\$29**
WebCode.....MSA3749

Microsoft Works Suite 2006

Five great titles in one affordable package Includes full versions of Word 2002, Works 8, Encarta Standard 2006, Digital Image Standard 2006 and Money Standard.

All the easy to use tools for home organisation, personal finance, photo editing and interactive learning.

Buy Works Suite and upgrade to Office for less!



Our Price **\$135** Save **\$34**
WebCode.....MSC2935

Office 2004 Pro for Mac

Microsoft Office 2004 for Mac Professional Edition gives you all the exciting new features of Office 2004 Standard Edition, plus Microsoft Virtual PC for Mac Version 7 to keep you better connected with the PC users in your professional and personal life.

Licensing pricing available.

Full (MSA3750) **\$759**



Upgrade
Our Price **\$484** Save **\$65**
WebCode.....MSA3751

Microsoft Works 8

Works 8 is the latest version of the popular essential home productivity software. It includes a word processor, spreadsheet, database and calendar. Plus, Works 8 has new, professionally designed templates and a new tool to help organise common projects.



Buy Works 8 & Upgrade to Office for less!
Our Price **\$82** Save **\$17**
WebCode.....MSC2920

Microsoft Publisher 2003

Publisher 2003 is a comprehensive solution for creating and publishing a wide variety of publications for desktop printing, commercial printing, e-mail distribution, or viewing on the Web. Publisher 2003 looks and works more like other programs in the Microsoft Office System, making it easier to use the right Office tool for the task

Upgrade (MSA4235) **\$155**

Full (MSA4234) **\$269**



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Academic*
Our Price **\$138** Save **\$21**
WebCode.....MSA4233

Microsoft FrontPage 2003

Use enhanced design tools to produce better looking Web sites. Generate better code, or expand your code skills. Use built-in scripting tools for interactive results. And with professional coding tools, you can write code faster, more efficiently, and with greater accuracy. Connect with people and information in new ways by building Extensible Markup Language (XML) data-driven Web sites.

Upgrade (MSA4217) **\$165**

Full (MSA4216) **\$319**



*for non-commercial use only

Academic*
Our Price **\$148** Save **\$11**
WebCode.....MSA4215

Microsoft Windows XP Pro with SP2

Delivers everything you demand from your computing experience. Whether you're on your own or running a business of any size, optimize your productivity with the digital world's latest innovations.

Full (MS59500) **\$425**

Upgrade (MS59502) **\$297**



*for non-commercial use only

Academic*
Our Price **\$113** Save **\$22**
WebCode.....MS59501

Microsoft Windows XP Home with SP2

Designed exclusively for home computing. Whether you're working with digital photos, music, or video, or building a home network, Windows XP innovations bring you into the digital age with ease.

Full (MSA5010) **\$285**



Upgrade
Our Price **\$149** Save **\$20**
WebCode.....MSA5011

Microsoft Plus! SuperPack for Windows XP

SuperPack for Windows XP is loaded with stunning screensavers and themes, exciting games, and great new ideas for customizing photos, music, and home movies. It's a wonderful way to take your Windows experience to the next level.



Our Price **\$49** Save **\$6**
WebCode.....MSA5012

Home & Office Software

Buying the latest IT Hardware?
Why not extend your warranty?
See page 2 for details!

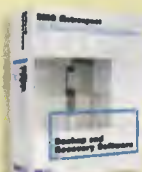
UP TO
3 Year
Warranty

EMC Insignia Retrospect Workgroup For Macintosh

- Protects servers, desktops, and notebooks
- Backs up Macintosh, Windows, and Red Hat Linux computers to a Macintosh computer
- Easy to set up and manage
- Fast, reliable, secure backups
- Smart restores with unparalleled accuracy
- Backup to disk, tape, or optical
- Simplifies media management

Retrospect Desktop 6.1
(DAN0029) \$209

Retrospect Server 6.1
(DAN0031) \$1095



Workgroup 6.1
Our Price **\$685** Save **\$89**
WebCode.....DAN0030

EMC Insignia Retrospect Single Server For Windows

- Protects servers, business-critical applications, desktops, and notebooks
- Backs up Windows, Macintosh, Linux, Solaris, and NetWare computers to a Windows computer
- Easy to set up and manage
- Fast, reliable, secure backups
- Smart restores with unparalleled accuracy

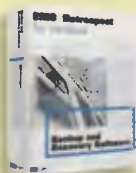
Retrospect Professional 7.5
(DAN0043) \$165

Retrospect Small Business
Server Standard 7.5
(DAN0038) \$699

Retrospect Small Business
Server Premium 7.5
(DAN0041) \$1045

Retrospect Disk to Disk 7.5
(DAN0042) \$561

Retrospect Multi Server 7.5
(DAN0039) \$2035



Single Server 7.5
Our Price **\$979** Save **\$70**
WebCode.....DAN0040

FileMaker Pro 8.5

This exciting new version includes the FileMaker Web Viewer that connects your database with the Web data that you rely on everyday – instantly and automatically! Also new is native support for Intel-based Macs, a learning center, new functions, new scripts and more!

New features include:

- FileMaker Web Viewer
- Custom Web Addresses
- Web Software Integration
- FileMaker Learning Center
- Object Functions & Scripts
- Universal Application

Upgrade (FIL1001) \$261
Academic (FIL1002) \$229

Our Price **\$453** Save **\$46**
WebCode.....FIL1000



FileMaker Server 8

High-performance server software for teams of FileMaker users that want to maximise the performance and security of their shared databases while automating backups and other administrative tasks.

Includes robust, real-time database sharing, advanced security options, and powerful, remote administration capabilities so you can:

- Bring your entire team together for maximum productivity
- Increase the performance of your shared databases
- Better protect your data with robust security features

Upgrade (FIL0161) \$495
Academic (FIL0162) \$855

Our Price **\$1642** Save **\$107**
WebCode.....FIL0160



FileMaker Pro 8.5 Advanced

FileMaker Pro 8.5 Advanced replaces FileMaker Developer and includes a suite of advanced development and customisation tools, as well as all the new features of FileMaker Pro 8.5, including the breakthrough FileMaker Web Viewer that delivers information from the Web directly to FileMaker Pro 8.5 – based on your FileMaker information. Plus, you'll get native support for Intel-based Macs, an online learning center, new functions, new scripts and more!

Upgrade (FIL1007) \$486
Academic (FIL1008) \$420

Our Price **\$846** Save **\$53**
WebCode.....FIL1006



FileMaker Pro 8.5 5 User Pack Work Faster. Share More.

The ideal solution for small businesses, workgroups or departments. This product is designed to start off your workgroup of five users. Get one free FileMaker licence when you buy a 5 User Pack – For the price of four licences you get five FileMaker Pro licences. Customers will receive a FileMaker Pro 8.5 five pack which contains one CD and five separate licence numbers.

Upgrade (FIL1004) \$1067
Academic (FIL1005) \$926

Full 5 User
Our Price **\$1778** Save **\$218**
WebCode.....FIL1003



ACT! 8 Standard

Make contact. Build relationships. Get results.

The #1 selling contact and customer manager helps selling professionals and small businesses make contact, build relationships and get results.

It allows you to:

- Manage up to 50,000 contacts
- Work with 1-9 users sharing the same database
- Create a running history with each contact
- Powerful lookups for easy access to contact details
- Forecast and track sales opportunities
- Integration with Hand-held devices
- Integrates with Lotus Notes and Outlook
- Access critical contact details through Citrix or Terminal services

Academic (ACT7017) \$155
Upgrade (ACT7013) \$154
6 Pack (ACT7014) \$1395
6 pack Upgrade (ACT7015) \$745
6 Pack Academic (ACT7018) \$792



**Buy ACT! Version 8
and get the next
upgrade FREE*.**

*Offer available from 1st August 2006 – 30th September 2006.
ACT! 8 FREE UPGRADE PROMO is available with ACT! 8 Retail full versions, ACT! 8 for Workgroups full versions and ACT! 8 for Web full version.

Customer must visit www.sagecrm.com.au/freeactupgrade to view Terms and Conditions and download the required form to be filled in and mailed with a copy of their receipt to Sage CRM.

Standard
Our Price **\$275** Save **\$24**
WebCode.....ACT7012

ACT! 8 Premium for Workgroups

- Manage up to 100,000 contacts
- Works with up to 50 users sharing the same database
- Create a running history with each contact
- Powerful lookups for easy access to contact details
- Forecast and track sales opportunities
- Integration with Hand-held devices
- Integrates with Lotus Notes and Outlook
- Access critical contact details through Citrix or Terminal services
- Schedule resources for meetings
- Advanced security features
- Synchronise via the internet
- Silent install by installing on the server and deploying out to network users

**Buy ACT! Version 8
and get the next
upgrade FREE*.**



For pricing and
information on volume licensing please contact
City Software 1300 658 600

ACT! 8 Link for MYOB

ACT! Link™ for MYOB - This link allows for a fast and easy way to share information between ACT! and your MYOB® Accounting program. Using Lightning-Fast Client Server Technology, this link will provide you with the MYOB integration you need to take control of your business, such as customer purchasing history, accounts receivable status and up-to-date contact information.



For pricing and
information on volume licensing please contact
City Software 1300 658 600

New Versions about to be released!
Order now to ensure your copy

MYOB Accounting 16

Complete Inventory and Business Management software for Australian businesses.

For owner operators. MYOB Accounting helps you manage your businesses requirements including inventory; by tracking, back-ordering, buying and building what you need, how you need.

MYOB Accounting has been designed and built for Australian conditions by Australia's leading business software supplier to allow you to:

- Control inventory
- Process sales and purchases
- Manage receivables and payables
- Handle your banking requirements
- Track GST and BAS
- Prepare budgets
- Email your quotes and invoices
- Comprehensive business reporting and more

Release in September!



Full	Upgrade
Our Price \$279 Save \$70	Our Price \$219 Save \$20
WebCode.....MYB0061	WebCode.....MYB0067

MYOB Accounting Plus 16

Business, payroll and time management software for Australian businesses with employees.

MYOB Accounting Plus is Australia's leading choice for business with employees.

Proudly developed and designed for Australian businesses, MYOB has created an easy to use program with integrated payroll, time billing and inventory management software which allow you to:

- Automate your payroll
- Bill for your time
- Control inventory
- Process sales and purchases
- Manage receivables and payables
- Track GST and BAS
- Prepare budgets
- Email your quotes and invoices
- Comprehensive business reporting and more

Release in September!



Full	Upgrade
Our Price \$477 Save \$118	Our Price \$278 Save \$71
WebCode.....MYB0062	WebCode.....MYB0068

MYOB Premier 10

Powerful multi-user software from Australia's choice and owned MYOB.

Issued with a three-user licence and with further licences available, MYOB Premier gives you the power to manage even the most complex business. Get the complete set of business, inventory, payroll and management features as found in MYOB Accounting Plus, plus more!

MYOB Premier enables Australian businesses to:

- Handle foreign currency transactions and accounts
- Automate their payroll and bill for time
- Manage multi level pricing on inventory
- Analyze their business with detailed powerful reports and more.

MYOB Premier comes with a 12 month subscription to MYOB Cover. A subscription that includes FREE phone, fax and email support, as well as automatic software upgrades and payroll updates to government changes and more...

Release in September!



Full
Our Price \$1278 Save \$217
WebCode.....MYB0064

MYOB FirstEdge

For an Australian small business using a Mac. From one easy program, track your GST and prepare your BAS, invoice your sales and manage your expenses and understand your business with detailed reports and more. The only solution for Australian businesses who want to control their business.

- Process sales and purchases
- Manage receivables and payables
- Track GST and BAS
- Email your quotes and invoices
- Comprehensive business reporting and more

You Pay \$132
\$32
After Cash Back*



Full
Our Price \$132 Save \$17
WebCode.....MYB0005

MYOB Business Basics

With MYOB BusinessBasics you'll save lots of time and effort as it keeps your banking, sales and contact information in one easy to use system.

Issue professional-looking tax invoices, track all money coming in and out, and keep a detailed history of your business transactions. All your information is organised and easy to access so you can spend more time on your business, not on the books.

Ideal for small or home based businesses!

You Pay \$125
\$25
After Cash Back*



Full
Our Price \$132 Save \$17
WebCode.....MYB0004

MYOB

AccountEdge 6

MYOB AccountEdge is Australia's leading choice for businesses with employees working on a Mac.

- Automate your payroll and bill for you time
- Handle foreign currency transactions and accounts
- Control inventory, sales and purchases.



Full
Our Price \$525 Save \$70
WebCode.....MYB0065

MYOB

Accounting Plus with Cover 16

MYOB Accounting Plus with Cover includes all the benefits of Accounting Plus, along with a 12month subscription to MYOB Cover which includes FREE product support via phone, fax and email and automatic software upgrades.



Full
Our Price \$688 Save \$161
WebCode.....MYB0063

MYOB Retail Manger 9

- Fast customer service
- Advanced Inventory management
- Manages promotions easily
- Includes 12 months of 7 day a week support & updates
- Integrates with MYOB Accounting, Accounting Plus & Premier



Full
Our Price \$1678 Save \$312
WebCode.....MYB0060

Accounting & Investment

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 3 Year Warranty

Quicken Personal Plus 2006

Quicken Personal Plus 2006 provides tools to help you manage your finances, prepare for tax time and plan for the future.

- Budgeting tools – help you manage your finances
- Monitor all of your personal and business investments
- Prepare for tax time
- Download your portfolio and trading history.



Full
Our Price **\$139** Save **\$10**
WebCode.....QUI0099

Quicken Payroll Premier 2006/07

Payroll Premier 2006/07 makes payroll easy, giving you more time to manage your business. The best selling stand alone payroll software in Australia is designed to keep you up to date, compliant with the latest legislation, and grows as your business needs grow.

- Be up to date with various government legislations
- Easy to set up and learn
- Track & manage employee records
- Fast-track your payroll processing
- A secure and permissions-based payroll system
- Information for Super Choice
- Easily view each payroll component
- Reduce time spent on employee records
- Enhanced accuracy



Full
Our Price **\$550** Save **\$49**
WebCode.....QUI0114



PC User magazine,
August 2006



QuickBooks EasyStart 2006/07

Ideal for new or very small businesses, QuickBooks EasyStart is the simplest way to manage sales, expenses and customers.

- Track Sales and Expenses
- Manage GST and BAS
- Reconcile your bank account
- Extensive help menu available from within the software program

Free!
After cash back*
During September.

* Offer by redemption from Quicken, Terms and Conditions apply.
Offer available for the month of September 2006 only.

Full Version
Our Price **\$89** Save **\$10**
WebCode.....QUI0100

Visit www.csw.com.au/promotions for all the latest promotions



PC User magazine,
August 2006



QuickBooks Accounting 2006/07

With powerful reporting and an integrated BAS, QuickBooks Accounting is the solution for small business.

- Integrated BAS
- Import bank statements
- Process credit card statements
- Track GST and prepare BAS
- Audit Company File wizard, to help maintain data integrity

Get the Quicken Advantage!*

Get the Quicken Advantage with QuickBooks – Awarded PC Users' Award winning Accounting Software for 2 years in a row.

- **BONUS 12 months Technical support**
- **BONUS 12 months product Upgrades and updates**
- **BONUS Priority customer service on a dedicated number.**

Full Version
Our Price **\$225** Save **\$24**
WebCode.....QUI0101

* Terms and conditions apply

Visit www.csw.com.au/promotions for all the latest promotions



PC User magazine,
August 2006



QuickBooks Plus 2006/07

QuickBooks Plus is perfect for small business with employees – it includes integrated payroll and inventory management.

- Invoice, pay bills and track expenses
- Process credit card statements
- Track inventory
- Integrated payroll management
- Integrated BAS and online lodgment

Get the Quicken Advantage!*

Get the Quicken Advantage with QuickBooks – Awarded PC Users' Award winning Accounting Software for 2 years in a row.

- **BONUS 12 months Technical support**
- **BONUS 12 months product Upgrades and updates**
- **BONUS Priority customer service on a dedicated number.**

* Terms and conditions apply. Visit www.csw.com.au/promotions for all the latest promotions

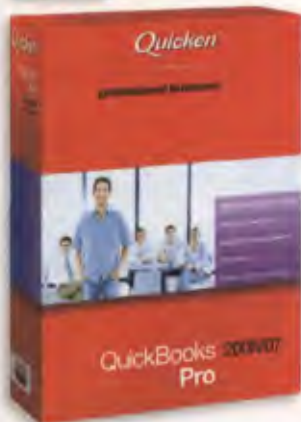
Subscription Our Price \$225 Save \$24 WebCode.....QUI0104	Upgrade Version Our Price \$345 Save \$44 WebCode.....QUI0103	Full Version Our Price \$489 Save \$60 WebCode.....QUI0102
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for
detail
smart
BUY
club
3%
rebate

Did you know that you can get
up to 3% rebate on every order?
www.csw.com.au/smartbuy



PC User magazine,
August 2006



QuickBooks Pro 2006/07

QuickBooks Pro has all the tools for a professional business, with MS Office integration, designed templates, estimates and job costing — see which projects are making money, and which ones are not.

- Process credit card statements
- Integrated payroll management
- Time billing and job costing
- Integration with Microsoft Office
- Multi-user enabled

Get the Quicken Advantage!*

Get the Quicken Advantage with QuickBooks — Awarded PC Users' Award winning Accounting Software for 2 years in a row.

- **BONUS 12 months Technical support**
- **BONUS 12 months product Upgrades and updates**
- **BONUS Priority customer service on a dedicated number.**

* Terms and conditions apply. Visit www.csw.com.au/promotions for all the latest promotions

Subscription	Upgrade Version	Full Version
Our Price \$269	Our Price \$445	Our Price \$715
Save \$30	Save \$54	Save \$84
WebCode.....QUI0107	WebCode.....QUI0106	WebCode.....QUI0105



PC User magazine,
August 2006



QuickBooks Premier 2006/07

The multi user solution — QuickBooks Premier is for two to five users, and has industry-specific editions tailored to your needs.

- Time billing and job costing
- Integration with Microsoft Office
- Multiple currency
- Up to five simultaneous users
- Industry specific editions

Get the Quicken Advantage!*

Get the Quicken Advantage with QuickBooks — Awarded PC Users' Award winning Accounting Software for 2 years in a row.

- **BONUS 12 months Technical support**
- **BONUS 12 months product Upgrades and updates**
- **BONUS Priority customer service on a dedicated number.**

* Terms and conditions apply. Visit www.csw.com.au/promotions for all the latest promotions

Subscription	Upgrade Version	Full Version
Our Price \$462	Our Price \$693	Our Price \$1379
Save \$67	Save \$106	Save \$220
WebCode.....QUI0110	WebCode.....QUI0109	WebCode.....QUI0108

Retail Starter Kit 2006/07 Hard Bundle

If you are opening your store for the first time, or upgrading from a cash register, then Quicken's Retail Starter Kit is what you need. Finding the right software is one thing but then having to find the point of sale hardware that is compatible with your software is another. The Retail Starter Kit has been designed to make getting started easy.

Included:

- QuickBooks Plus 2006/07 for your inventory, customer account, accounting and reporting requirements
- Retail Point of Sale 2006/07 for fast sales processing at the front of store
- Thermal receipt printer
- Cash drawer
- Barcode scanner



Full Version
Our Price \$865
Save \$134
WebCode.....QUI0113

Quicken Retail Point of Sale 2006/07

Retail Point of Sale is retail intelligence at your fingertips, including the features you need to track all of your sales, inventory, purchase orders, customers and accounting.

- Seamless integration to QuickBooks
- Industry standard hardware
- Fast sales processing
- Touch screen compatible
- Front counter management
- Customer management tools
- Inventory control



Full
Our Price \$448
Save \$51
WebCode.....QUI0112

Quicken Advantage

Designed so that your focus remains on your business, and not on your business software. Quicken Advantage gives you the tools to keep you on top of your software needs. The key benefits of membership include:

- Unlimited weekday technical support
- All Upgrades sent to you upon release at no additional cost.
- Dedicated Advantage contact numbers to help you stay in touch with Quicken or access our specialised Advantage Technical Support team.
- A personal email as soon as any software updates are available so you download them directly from the web.
- Quarterly Advantage Newsletter by email
- Special training offers
- Bonus Quicken Advantage on full version of QuickBooks Accounting, Plus, Pro and Premier 2006/07.

* Please note that terms and conditions apply to the Quicken Advantage Membership Program



Sophos Client Firewall

- Protects Desktops and Laptops
- Centrally managed with Sophos Anti-Virus
- Locks down vulnerable computers
- Uses stealth technology to shield against hackers using port scanning
- Blocks internet worms, closes inactive ports, prevents unauthorized applications from running, and monitors application behaviour



This product must be bought in conjunction with Sophos Anti-Virus

Call CSW-iT
for a quote
1300 761 761

Sophos Email Security Appliance

- Protection for enterprise email networks
- Intelligent and easy to manage
- Innovative threat detection technologies
- Actionable tools and reports
- Remote heartbeat monitoring
- Maximum update ensured
- Updates every 5 minutes.



Call CSW-iT
for a quote
1300 761 761

SOPHOS

Sophos is a trusted global provider of integrated threat management solutions for business, education and government, providing protection against viruses, spam, Trojans, worms and spyware, whilst simultaneously enforcing corporate messaging policies. Over 35 million users from organisations of all sizes benefit from Sophos' technology.

Sophos Enterprise Security Endpoint and Gateway Security

Sophos Anti-Virus™

Sophos Anti-Virus for Windows provides complex networks with rapid integrated protection against known and unknown malware and against threats to productivity such as adware and other potentially unwanted applications.

It can be centrally installed, configured and monitored across the network, along with Sophos Client Firewall™, from a single console. It updates automatically with the latest protection from SophosLabs™

Sophos PureMessage™

An advanced flexible and secure mail filtering solution protecting Windows®/Exchange and UNIX servers against viruses, spam and other email-borne security threats.

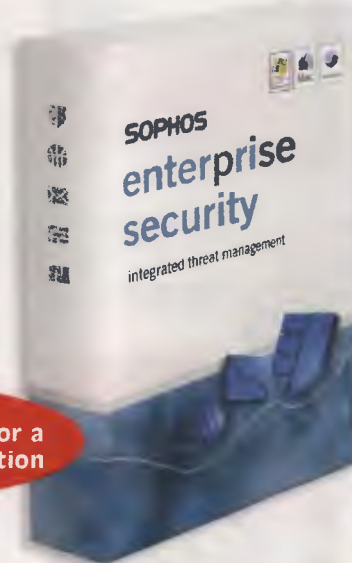
Based on a scalable architecture, PureMessage™ includes innovative detection techniques that deliver proactive, sustained protection.

Sophos Enterprise Solutions

Genotype technology - proactively blocks new virus and spam threats before specific detection is available.

- Unlimited 24/7 telephone technical support
- SophosLabs™ - round the clock threat analysis centres
- Automatic virus and spam updates 24 hours a day
- Central installation, configuration and management
- Integrated, multi-platform protection
- Free home use for all Sophos Anti-Virus and Sophos Enterprise Security Customers

Go to
www.sophos.com for a
FREE 30 day Evaluation



Call CSW-iT for a quote
1300 761 761

Sophos Small Business Suite Endpoint and Gateway Security for 5-25 Users

Sophos Anti-Virus™ Small Business Edition

Protects both Windows® and Macintosh desktops and file servers, against viruses, Trojans, worms and malicious spyware.

The latest virus and product updates are automatically delivered from Sophos hourly. Roaming laptop users can also receive these updates either directly from Sophos or from their company's website.

Sophos PureMessage™ Small Business Edition

Sophos PureMessage™ Small Business Edition protects Microsoft Exchange and Windows® SMTP email servers by detecting, reporting and disinfecting viruses, Trojans, worms, malicious spyware and spam. Virus identities and spam rules are updated automatically over the internet by Sophos AutoUpdate.

Sophos Small Business Suite includes

- Multi-tier protection at the desktop and gateway
- Blocks unsolicited emails, keeping your inbox free of junk mail
- Automatic virus and spam updates 24 hours a day
- Unlimited 24/7 technical support, no hidden costs
- Monitors all virus entry points
- Easy-to-use and manage
- SophosLabs™ - round the clock threat analysis centres
- Central installation, configuration and management

Go to
www.sophos.com for a
FREE 30 day Evaluation

Sophos Small Business Suite protects Windows® 98SE/ME/2000/2003/XP Home and Pro, and Mac OS X 10.2 and higher operating systems, Microsoft Exchange and SMTP servers.

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All trademarks are the property of their respective owners



5 User	10 User	15 User
Our Price \$660 Save \$42	Our Price \$1250 Save \$90	Our Price \$1900 Save \$111
WebCode.....SOP0006	WebCode.....SOP0009	WebCode.....SOP0012

See page 2
for
details!



Did you know that you can get
up to 3% rebate on every order?
www.csw.com.au/smartbuy

Norton Save & Restore Bundle

- Automatically safeguards photos, videos, music, documents & essential system files
- Backs up an entire drive or just selected files and folders
- Recovers your data even when your O/S won't start
- Makes incremental backups, saving space and time
- Encrypts backups for added security
- Makes backups on the fly to almost any media

Bundle Includes:
Seagate Pocket Drive 5.0 GB!

The pocket drive is an elegant, palm-sized 5 gigabyte harddrive



Our Price \$195 **Save \$24**
WebCode: CCG0209

Norton Save & Restore

- Automatically safeguards photos, videos, music, documents & essential system files
- Backs up an entire drive or just selected files and folders
- Recovers your data even when your O/S won't start
- Makes incremental backups, saving space and time
- Encrypts backups for added security
- Makes backups on the fly to almost any media

\$30 Cashback*



*Strictly limited stock at this price
Offer open until Sep 30, 06.
Customer must retain their sales receipt and submit via the Symantec web site: www.symantec.com/au/nz-norton2006 \$30 cash back offer only applicable to full version!

Our Price \$84 **Save \$15**
WebCode: SYM9834

Norton Internet Security 2006

A comprehensive set of award-winning tools, Norton Internet Security automatically blocks hackers, viruses, and spyware. It filters out phishing email and spam, while its privacy and parental controls protect your personal information and shield your children from harm. And should your operating system or browser have a security hole, Norton Internet Security is there to handle resulting attacks. With all these tools working for you, you're free to get connected, stay connected, and use the Internet however you want.

Win a Sony DVD Walkman

*Strictly limited stock at this price
Offer open until Sep 30, 06.
Customer must retain their sales receipt and submit via the Symantec web site: www.symantec.com/au/nz-norton2006 \$40 cash back offer only applicable to full version!

Our Price \$67 **Save \$62**
WebCode: SYM9689

Norton AntiVirus 2006

Stay protected with the world's most trusted antivirus software.* Norton AntiVirus 2006 wards off a host of Internet threats. Whether it's surfing or chatting, emailing or file swapping, Norton AntiVirus is continuously at work in the background. It automatically detects and removes viruses, Trojan horses, and worms. It rids your computer of unwanted spyware, adware, and other monitoring software. And it scans both email and IM attachments for threats. Even if your computer is already infected, Norton AntiVirus can quarantine and remove the threat.

*Top-selling antivirus software product from Dec 2000 through May 2005 based on NPD Group's retail Top Selling Business Software list.

3 User (SYM9662) **\$83**
5 User (SYM9687) **\$121**
10 User (SYM9688) **\$198**

Our Price \$49 **Save \$30**
WebCode: SYM9685

Norton Freedom Bundle

Internet Security 2006 & SystemWorks Premier 2006 With the Freedom Bundle, you have the most comprehensive set of Norton security and performance tools. Norton Internet Security protects you while you surf the Web, shop on the Internet, bank online, share photos with your family and friends by email or IM, or download programs, files and music. And protects your children as they explore cyberspace. The performance tools in Norton SystemWorks Premier keep your computer healthy, optimized and backed up. If trouble does occur, Norton SystemWorks Premier helps you repair the damage, restore your system, and recover your files.

*Offer open until Sep 30, 06.
Customer must retain their sales receipt and submit via the Symantec web site: www.symantec.com/au/nz-norton2006 \$40 cash back offer only applicable to full version!

Our Price \$115 **Save \$84**
WebCode: SYM9700

Norton Partition Magic 8

Symantec's Norton Partition Magic 8.0 lets you easily organise your hard drive by creating, resizing, copying, and merging disk partitions. Separate your operating system, applications, documents, music, photos, games, and backup files to reduce the risk of data loss if your system crashes. You can use Norton Partition Magic 8.0 to run multiple operating systems safely.



Easily organise your hard drive.

Our Price \$95 **Save \$24**
WebCode: SYM2560

Norton SystemWorks 2006 Premier

Optimize your computer experience with Norton SystemWorks 2006 Premier. This powerful solution offers advanced protection, automatically backing up everything on your computer. It also prevents many problems, keeping your computer healthy and optimized. And when trouble does occur, Norton SystemWorks Premier is there to help you repair the damage and recover your system. Its antivirus protection-the most trusted on the planet*-protects you from viruses, worms, Trojan horses, and dangerous spyware.

5 User (SYM9694) **\$215**
10 User (SYM9696) **\$359**

*Offer open until Sep 30, 06.
Customer must retain their sales receipt and submit via the Symantec web site: www.symantec.com/au/nz-norton2006 \$40 cash back offer only applicable to full version!

Our Price \$112 **Save \$37**
WebCode: SYM9657

Symantec pcAnywhere 12.0 Host & Remote

Combines secure, industry-leading remote control with remote management and advanced file transfer to help IT personnel quickly resolve helpdesk and server support problems. Offers comprehensive security, including support for 13 authentication types, including RSA SecurID.

Host and Remote Academic (SYE6172) **\$175**
Host only (SYM9844) **\$170**
Host only Academic (SYE6173) **\$111**

Multi user packs available!



Our Price \$273 **Save \$26**
WebCode: SYM9842

Symantec AntiVirus 10.1

Symantec AntiVirus 10.1 protects your clients and servers against viruses, adware and spyware. Easy, centralised management of virus protection.

5 User with Groupware (SYM9865) **\$567**
10 User with Groupware (SYM9866) **\$1049**
10 User (SYM9860) **\$792**

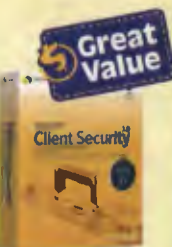


Our Price \$418 **Save \$71**
WebCode: SYM9859

Symantec Client Security 3.1

More than anti-virus: protection from unauthorised access. Email and the Internet make your business more flexible. However, hackers, viruses, worms, Trojan horses, blended threats, spyware and adware can severely compromise the safety of your computers and business data. Therefore, anti-virus software alone is no longer enough. Symantec Client Security 3.1 seamlessly integrates anti-virus, firewall and intrusion detection actively preventing known and unknown threats from entering your IT system in the first place.

5 User with Groupware (SYM9853) **\$770**
10 User (SYM9848) **\$1050**
10 User with Groupware (SYM9854) **\$1450**



Our Price \$550 **Save \$80**
WebCode: SYM9847

Home & Small Business Protection

Buying the latest IT Hardware? Why not extend your warranty! See page 2 for details!

UP TO 5 Year Warranty

McAfee VirusScan Plus

AntiVirus, Firewall & AntiSpyware

With the wide variety of viruses, hackers and blended threats lurking on the Internet today, you need more than a simple anti-virus program to keep your PC and files secure. McAfee VirusScan Plus AntiVirus, Firewall & AntiSpyware is the essential combination of protection to combat and defeat even the most sophisticated attacks. Surf the Web and download files safely knowing McAfee shields your computer around the clock.

Academic (MCF2155) \$40

Upgrade (MCF2139) \$30



Our Price **\$49** Save **\$10**
WebCode.....MCF2137

McAfee Secure Messaging Service

McAfee Secure Messaging Service (SMS) deploys quickly and easily to help block spam, phishing, viruses, and other e-mail threats from impacting your network and staff, 24/7.



WIN a PSP

Download a free trial at www.mcafee.com.au/anz/promotions/sms and tell us how SMS will solve your business problems. Entries will be judged and drawn on the 30th September 06 then a winner will be notified by email.

Plus the first 10 entries automatically WIN \$25 worth of Westfield vouchers each

For Terms and Conditions please to enter visit www.mcafee.com.au/anz/promotions/sms



Contact Us For
More Information!
1300 658 600

McAfee Internet Security 2007 - 8-in-1 Protection

McAfee Internet Security Suite is 8-in-1 protection for your PC, important files, identity and online experience. Relax knowing that you always have the latest protection updates, software upgrades and enhancements automatically delivered to you.

- Stops Viruses. Automatically blocks, cleans, and removes viruses so you can surf the Web and download files.
- Blocks Spyware. Blocks spyware before it can install on your computer, and removes existing spyware.
- Stops Hackers. Protects and conceals your computer from hackers so you can surf the Internet safely.
- Improves PC Performance. Cleans clutter off your computer to keep it healthy and running smoothly.
- Backs Up & Restores Files. Automated backup and one-click restore ensures that you don't lose

Buy McAfee Internet Security Single user license and receive a Targus 4 port USB hub Free via redemption.

Academic	Upgrade	Full
Our Price \$65 Save \$14	Our Price \$49 Save \$10	Our Price \$79 Save \$20
WebCode.....MCF2157	WebCode.....MCF2147	WebCode.....MCF2144

McAfee PC Protection Plus

VirusScan Plus, Backup & Restore Protect Your PC and Life Memories

With photos, music, videos and valuable documents stored on your PC, it's more important than ever to protect yourself from viruses, spyware and hackers. You also need an easy way to back up and restore your important files. McAfee PC Protection Plus provides essential protection while surfing the Web and downloading files. It also makes it easier than ever to back up and restore photos, music, videos and other important information.

5-In-1 Protection

- Stops Viruses - Automatically blocks, cleans and removes viruses so you can surf the Web and download files safely.
- Blocks Spyware. McAfee also blocks spyware before it can install on your computer, and removes existing spyware.
- Stops Hackers. McAfee PC Protection Plus protects and conceals your computer from hackers so you can connect to the Internet safely.
- Improves PC Performance. Cleans clutter off of your computer to keep it healthy and running smoothly.
- Backs Up & Restores Files. McAfee's trusted computer protection also offers simple but powerful automated backup with a one-click feature to restore photos, music, videos and other important files.

Academic	Upgrade	Full
Our Price \$46 Save \$10	Our Price \$33 Save \$6	Our Price \$57 Save \$12
WebCode.....MCF2156	WebCode.....MCF2143	WebCode.....MCF2141

McAfee Total Protection for Small Business

The always on, always up-to-date, single solution for protecting today's small business.

Does your business need comprehensive 24x7 security for your desktops and servers -- but don't have the time, budget or manpower to manage it yourself? Relax. With McAfee Total Protection for Small Business, we do all the work -- so you don't have to! McAfee experts work behind the scenes 24x7 to update and protect your Desktops and File Servers against viruses, spyware, hacker attacks and identity thieves. Includes everything you need in one, integrated package, with automatic security updates and a single reporting and configuration console via the McAfee SecurityCenter -- so there's no additional hardware or software to buy.

- Downloadable
- Total desktop and server protection, in one integrated package
- Includes Anti-Virus, Anti-Spyware, Firewall and Enhanced Email Virus protection 100% managed by McAfee experts
- Updates automatically 24x7, even for PCs not connected to the Internet
- Single, Web-based reporting and configuration console
- Easy on-line installation and deployment

Contact Us for More Information on hosted Services! 1300 761 761

* Pricing dependent on number of seats covered

McAfee Total Protection for Small Business - Advanced

The always on, always up-to-date, single solution for protecting today's small business - With enhanced Email, Anti-Phishing and Anti-Spam protection. An integrated solution with built-in automatic protection against viruses, spyware, hackers and identity thieves, it provides protection across your small business environment. With the McAfee Total Protection for Small Business-Advanced, you get added e-mail protection against spam, phishing, inappropriate content, and viruses. Through the McAfee SecurityCenter - our easy-to-use Web-based management and reporting console, you can monitor your virus, spyware, firewall, and e-mail protection, customise security policies, and view remediation actions and infection reports.

- Protect your systems automatically - Provides always-on protection with daily, automated security updates
- It's a single, comprehensive solution - Along with the McAfee SecurityCenter management console, it delivers all-in-one desktop, server and e-mail protection to combat viruses, spyware, spam, phishing and hacker attacks
- Easy to use, easy to install: Single online installation gives you proactive protection from viruses, spyware and hacker attacks; and for advanced e-mail protection, simply redirect your mail exchange record to McAfee
- Affordable security and support: The annual subscription ensures continuous protection with automatic updates and upgrades, along with around-the-clock technical support—all for one low cost

Total Protection Advanced requires that you own a unique email domain and a mail server with a static IP address

Contact Us for More Information on hosted Services! 1300 761 761

* Pricing dependent on number of seats covered



Protection starts from
around \$70 per seat*



Protection starts from
around \$70 per seat*

See page 2
for
detail

smart
BUY
club
3%
rebate

Did you know that you can get
up to 3% rebate on every order?
www.csw.com.au/smartbuy

Roxio Easy Media Creator 9 Your Music, Memories, Movies and More

Get the most out of your digital videos, music and photos. Creator 9 lets you create, manage and enjoy them the way you want, on your computer, home theatre, or TV - and even on the move with your iPod, PSP or mobile phone. With dozens of new and improved features and Blu-ray disc compatibility, Creator 9 is the essential software for your digital life

New! Share your memories and your movies

- Easy photo transfer from mobile phone camera to PC
- Emailable photo postcards for every occasion
- fast and efficient digital video and HD video capture with SmartScan.
- Fit-to-DVD compression optimises video quality & disc space
- Video Doctor auto correction of video colour, contrast and brightness.
- Impressive new widescreen styles with matching chapter menus
- Easy removal of commercials from set-top DVD recorder discs
- CineMagic auto movie creation now with professionally -designed cool styles, production quality intros and easy scene selection
- Blu-ray disc burning-hours of hi-def or standard definition video.
- File conversion of virtually all video formats.
- DivX or WMV file conversion for iPod, PSP, Mobile phone and more.

New! Your digital life - to go.

- Easy music, photo, and video sharing-transfer to iPod, PSP, mobile phone or other portable device.
- Simple photo transfer from mobile phone camera to PC.
- LiveShare peer-to-peer photo sharing - now supports mobile phones
- Media access and playback from UPnP-compliant living room devices with PC remote control

New! Re-mix and rediscover your music

- Automatic perfect mixes from your PC music library.
- 50 hour music DVDs with custom on-screen menus and random play shuffle options.
- 'Pre-roll' captures any audio playing on your PC even before you push 'record'.
- Automatic renaming of incorrectly tagged song files
- Fast music transfer to iPod, PSP or mobile phone.

New! Back up fast and copy with ease.

- Easy backups with up to 50 GB of data on a single Blu-ray disc.
- Movies to go - back up DVDs and copy video to iPod, PSP and mobile phones
- Custom Menu styles from your DVD compilation discs
- Copies and compilations from discs created in set top DVD recorders.



Full
Our Price **\$139** Save **\$15**
WebCode.....ADA9518

Roxio DVD Copy 2

New Roxio Easy DVD Copy™ 2 Premier takes you well beyond other copying software. Make fast, high quality copies of movies, music CDs and DVDs. Compress an entire 9 GB double layer DVD Video to a standard 4.7 GB DVD disc. Maximize video quality and available disc space by selecting which movies, extras, languages, subtitles, and audio formats to include. Create custom DVD and DivX® movie compilations. Play Hollywood movies on your PC. Print personalized disc labels - even directly on disc with LightScribe-supported printers and burners. Now includes support for PSP and video iPod.



Our Price **\$52** Save **\$7**
WebCode.....ADA7222

Roxio PhotoSuite & VideoWave Premier Suite 8

PhotoSuite® 8 puts the power to create spectacular photo projects of the highest quality right in your hands. With One Button Photo Fix, Smart Views, and Peer-to-Peer photo sharing your life just got a whole lot more organized. What's more, the DVD creation capability turns your slideshow productions into DVDs that you can easily share with friends and family on your TV!

- Crop & rotate photos, remove red eye
- Capture video bursts along with still image
- Add up to 999 photos per DVD slideshow menu
- Create 16:9 (widescreen) DVD slideshows
- Share with online Peer-to-Peer photo sharing
- Access photos spread across multiple computers



Our Price **\$112** Save **\$37**
WebCode.....ADA9517

Roxio Toast 7 Titanium

- Create video CDs/DVDs with selectable menu styles
- Download DivX movies & create DVDs to watch anywhere
- Enjoy over 50 hours of music on a DVD
- Span large files, folders & apps across multiple CDs/DVDs

Toast 7 is the best way to save, share and enjoy a lifetime of digital music, movies and photos on CD and DVD. Burn large files across multiple discs; compress and copy DVD movies; add over 50 hours of music to an audio DVD with on-screen TV menus, shuffle play, and rich Dolby Digital sound; burn DivX files into DVDs. Do it all with the fastest and most reliable burning software for the Mac OS - Toast.



Our Price **\$127** Save **\$22**
WebCode.....ADA9480

Trend Micro 2006 PC-cillin Antivirus

Award-winning PC-cillin Antivirus helps detect and prevent viruses and other threats from infecting your PC. Designed with a simple interface, PC-cillin is the best way to vaccinate your PC effectively. Removes viruses automatically, protects email and instant messages, stops spyware, automatic updates, proactive outbreak alert, includes 12 months of updates and support. Safeguard your email, files and Internet downloads.



Our Price **\$39** Save **\$10**
WebCode.....MAN0068

Nitro PDF

- Fast and simple PDF creating and editing
- Reliably distribute documents anywhere in the world
- Simpler and more cost effective PDF editing capabilities than other PDF software on the market
- Secure documents with passwords and digital signatures



Our Price **\$154** Save **\$45**
WebCode.....NIT0001

Manacomm ZoneAlarm Security Suite 6

Easy-to-use, comprehensive protection against hackers, spyware, worms, identity thieves, spam and much more. With 12 months of updates and support it is perfect for the home user. The triple defense firewall goes beyond traditional firewalls to protect your entire PC from hackers, spyware, and other Internet threats.

Pro 6 (CHE0017) \$74
Antivirus 6 (CHE0019) \$74



Our Price **\$79** Save **\$20**
WebCode.....CHE0018

Gecko Trance headphones for iPod

Gecko Trance in-ear headphones for iPod. Ultra cool headphones. Deep bass and crisp treble bring out the very best in your tunes! Chill out or groove-it-up with gecko trance headphones. Includes two different colour sets of ear phone pads. Mix-it-up.



Our Price **\$19** Save **\$11**
WebCode: PWR0080

Gecko Duo Charge

Gecko duo-charge. The iPod power adaptor with so much more! Charges up to two iPods at the same time, suits all iPods including iPod shuffle. Gecko's unique pin system delivers power for USA, Australia and NZ from a single twist of the pins. BONUS USB - iPod connection cable included.



* iPod Not Included*
Our Price **\$27** Save **\$12**
WebCode: PWR0184

Gecko in Car Duo Charge

iPod in-car Duo charger allows you to charge your iPod in your car, boat, caravan or anywhere else you have a 12v power outlet. Includes a special USB to 30pin dock connector and mini USB connector cable allowing you to charge iPod shuffle, other MP3 players and mobile phones. Includes a replaceable fuse to protect iPod from excessive power loads.

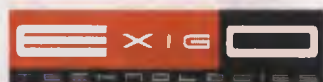


Our Price **\$29** Save **\$19**
WebCode: PWR0066

Exigo MP3 Player

Flash Based MP3 players changed the way people share their passion for music. With the Exigo MP3 Players line you can enjoy a wide range of functions and crystal clear quality of sound at a reasonable price.

- ID3 text display: Seven colour backlight
- Music Format: MP3 or WMA
- Equalizer Mode: 7 different modes (Natural, Rock, POP, Classic, Soft, Jazz, DBB)
- 5 Playing Modes: Cycle one/ Cycle all/ Play random/ Play normal/ Special preview mode
- 1 pc AAA battery: Can play more than 6 hours
- Integrated FM Radio
- Voice recording: 270mins per 64MB
- Frequency Response: 20Hz-20KHz
- Warranty: 2 Years
- Support OS: Windows 98/Me/2000/XP/Mac OS 9.X/Linux 2.4.X



1GB
Our Price **\$66** Save **\$22**
WebCode: EX10006

2GB
Our Price **\$97** Save **\$32**
WebCode: EX10007



Apple 2GB iPod Nano

Take everything you love about iPod and shrink it. Now shrink it again. With 2GB the pencil-thin iPod nano packs the lot into an impossibly small design. Take your music places you never dreamed of. Holds up to 500 songs and full-colour album art. 9 x 4 x 0.7 cm and weighs only 42 grams.

- 1.5" colour LCD display
- Up to 14 hours of battery life
- Works with Mac OS X or Windows 2000/XP

2GB Black (APP0127) **\$289**
4GB White (APP0128) **\$349**
4GB Black (APP0129) **\$349**

1GB
Our Price **\$289** Save **\$10**
WebCode: APP0126



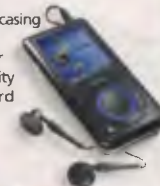
Sandisk Sansa e250 2GB MP3 Player

Everything you need to play digital music - in vibrant colour! The Sansa e200 Series MP3 players are the flagship products of SanDisk's audio line.

- 1.8" TFT colour screen
- Strong Liquidmetal back casing
- Photo/Video Playback
- MicroSD expansion slot for additional memory capacity
- FM tuner and FM record
- Voice recording with built-in microphone

4GB (SAN0055) **\$336**
6GB (SAN0056) **\$425**

Our Price **\$259** Save **\$40**
WebCode: SAN0054



Xtrememac Airplay 2 FM Transmitter for iPod Black

- High quality, wireless FM transmission
- Brilliant blue LCD with easy-to-read white characters
- Three programmable station presets for convenient recall of clearest frequencies
- iPod powered, uses minimal amount of energy
- Pass-through Dock Connector functionality
- Compatible with all 30-pin car chargers
- Stereo/mono control
- Includes Dash mount
- Tuning range: 88.1 - 107.9

Our Price **\$73** Save **\$26**
WebCode: PWR0079



Gecko Starter Pack for iPod nano

4 must have accessories for nano users. Bundle Includes Silicon glove for the ultimate scratch and bump protection, nano guard protection film, to protect the surface of your nano, a car charger, and an RCA cable, for connection to your home stereo. Bundle Contents Super tough silicone glove with gecko grip nano guard (front) face protection film, Car charger, iPod to home stereo RCA cable

Line List - White (PWR0071) **\$39**

Our Price **\$39** Save **\$10**
WebCode: PWR0070



I-Rocks MP3 CAR DJ FM Transmitter

Plug-in your USB flash drive, mp3 player or any audio source with an output such as your PDA or CD player into the mp3 DJ, tune in your car stereo and enjoy listening to your favourite digital music over while you drive.

Silver (IRS0024) **\$58**
White (IRS0025) **\$58**
Black (IRS0026) **\$58**

Now With Track Recognition

Blue
Our Price **\$58** Save **\$10**
WebCode: IRS0023



Logitech mm50 Portable Speakers for iPod

The Logitech mm50 Portable Speakers for iPod uses 3" pressure drivers for maximum bass and minimum distortion. Rechargeable Li-ion batteries last up to 10 hours, charge the speaker system and iPod battery simultaneously. 3-D sound processing widens the stereo effect, so sound seems to come from an area two feet wider than the speaker itself. Custom travel case, so you can take the big sound anywhere.

White (LOG3511) **\$186**

* iPod Not Included*
Our Price **\$186** Save **\$44**
WebCode: LOG3511



DLO Home Dock Deluxe for iPod

This is what you've been waiting for. The DLO HomeDock Deluxe is the world's first iPod dock that lets you view and select your iPod's music on your TV screen. View current song information and navigate playlists, artists and albums from the sofa. Never has it been more fun and easy to enjoy your iPod at home than with the HomeDock Deluxe.

Like the DLO HomeDock, the HomeDock Deluxe contains everything you need to get started right out of the box. Simply attach the included power supply and AV cables to your stereo and TV, dock your iPod or iPod nano (HomeDock fits any dockable iPod) and the turn your HomeDock on with the included 20 function remote control. That's when the fun really begins.

View iPod photos and Videos on your TV

* iPod Not Included*

Our Price **\$243** Save **\$56**
WebCode: PWR0042



Canon Powershot A530 5MP

Boasting powerful Canon 4x optical zoom lenses and Canon's intuitive DiGIC processor, the 5.0MP PowerShot A530 delivers simply better pictures. With a versatile range of shooting modes, you can capture it all, from family photos to travel snaps. And best of all, these compact cameras are easy to use. Thanks to the Canon Print/Share Button, true to life photo prints straight from the camera are a snap. The PowerShot A530 makes it easy to take digital photography further.



5
Megapixel

4x
Optical Zoom

1.8"
LCD Screen

Our Price \$279 **Save \$70**

WebCode.....CAN0483

Canon Ixus 60 6MP

The 6.0 Megapixel IXUS 60 offers a sharp combination of cutting edge technology and ultra compact style. Featuring Canon's fully retractable 3x optical zoom lenses deliver sharp, high resolution images. True to life photo prints straight from the camera are a snap thanks to the Canon Print/Share Button and its huge LCD monitor is the perfect way to review photos and movie clips.



6
Megapixel

3x
Optical Zoom

2.5"
LCD Screen

Our Price \$420 **Save \$159**

WebCode.....CAN0495

Kodak EasyShare V610 6.1MP

World's smallest 10X optical zoom digital camera.

- Kodak Retina Dual Lens Technology
- Get a good look at your pictures on the large 2.8 in. (7.1 cm) high resolution color display with wide viewing angle
- Embedded Bluetooth Wireless Technology
- 6.1 MP for prints up to 30 x 40 in. (76 x 102 cm)
- Advanced video features
- On-camera picture enhancing features
- Advanced video features



6.1
Megapixel

10x
Optical Zoom

2.8"
LCD Screen

Our Price \$529 **Save \$70**

WebCode.....KOD0610

Casio Exilim EX-Z600 6MP Blue

The EX-Z600 offers 6.0 megapixel high resolution photos in a stylish, compact, and pocket-sized package. The extra large 2.7-inch Super Bright LCD produces an impressive luminance of 1200 candelas per square meter. This significant advancement makes the LCD easier to see, especially when viewed in the sunny outdoors. In auto mode, the LCD automatically adjusts to the brightness of the surrounding environment. The EX-Z600's Super Life Battery now supports a staggering 550 shots per charge.



6
Megapixel

3x
Optical Zoom

2.7"
LCD Screen

Our Price \$533 **Save \$46**

WebCode.....DC0002

Olympus Tough 720SW 7.1MP

The new Tough 720SW is the latest innovation by Olympus. Olympus prides itself on it's revolutionary technology and cutting edge sleek designs. Olympus has gone that one step better, taking digital photography to an entire new level with the introduction of the World's First Shockproof and Waterproof digital camera

- Water Proof (3m)
- Shock Proof (1.5m)
- 19.1 MB Internal Memory



7.1
Megapixel

3x
Optical Zoom

2.5"
LCD Screen

Our Price \$539 **Save \$60**

WebCode.....OLY0075

Sony DSCN1 8.1MP

Cyber-shot DSCN1 opens a new world of shooting and sharing, with 8.1 megapixel performance and internal memory that holds up to 500 VGA images for pocket album viewing anywhere, anytime. A huge 3.0" LCD Monitor with Clear Photo LCD Plus technology provides touch-screen convenience for controlling camera functions and searching thumbnail images -- and Free Spot AF lets you focus on a subject by just touching it on screen.



8.1
Megapixel

3x
Optical Zoom

3"
LCD Screen

Our Price \$718 **Save \$181**

WebCode.....SNY0705

Sony Widescreen DVD Handycam

Capture spectacular Widescreen footage with this Mega Pixel DVD Handycam. Equipped with a 1.1 Mega Pixel CCD the High Quality 16:9 Widescreen recording mode will increase your field of view for playback on widescreen televisions. Monitor your recordings using the WIDE 2.7" Touch Screen LCD. Widescreen recordings will be displayed in their true aspect ration on this properly proportioned LCD, ensuring you see all the action with superb accuracy.



1.1
Megapixel

16:9
Widescreen

DVD
Storage

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Canon Widescreen DVD Video Camera DC40

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Megapixel

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WebCode.....PIN0140

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Academic (PIN0123) **\$143**



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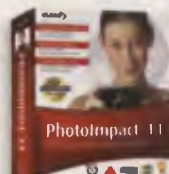


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Academic (SON0056) **\$121**

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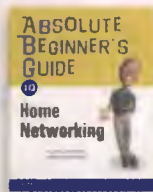
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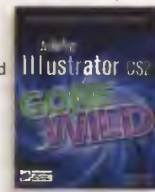
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Gone Wild Illustrator CS2

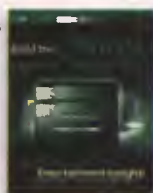
Hang on tight Illustrator is about to blow you away in fact, using the techniques in this book, you could transform a photo of yourself to look as if that was literally happening. Achieve over-the-top visuals including type on a 3D spiral, exaggerated dot patterns that create comic book characters inspired by Roy Lichtenstein, Escher-esque shapes in simulated 3D, hip-hop type, amazing animation, effects that would make Andy Warhol proud - more than fifty in all, and each one described step by step and illustrated in breathtaking color. Wild!



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Complete Wireless Home Networking

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- Targets home wireless networking, explaining how to add wireless devices of all types, it also has a section for the best free advice on the Web.



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Safeguarding Your Wi-Fi LAN

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- Explains all 802.11 security solutions; covers WEP, 802.11i, WPA, and EAP.



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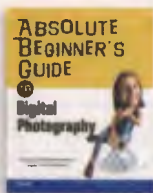
10 years, 10 editions: the multi-million-selling Internet book has come of age and is still the ultimate handbook for novices and experts alike. Written in plain English, it covers everything from getting online for the first time to advanced tips and tricks guaranteed to turn casual surfers into Net gurus. Whether you've never sent an email or you want to keep up with the latest developments, you need this book.



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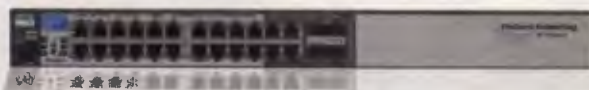
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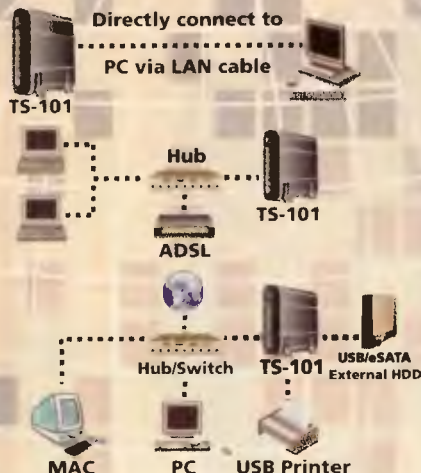
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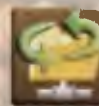
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Business Data Storage and Management

How to make your data available when you really need it.

Every business stores data. But it's the businesses that are able to organise and manage it so that it's instantly available that have the competitive advantage.

In this special supplement, we look at all the options available to a business for improving its data management:

- **Document Management** — what it means for a business and the best solutions
- **Document Presentations**
- **Printers** — the best options for business
- **Data Storage Hardware**
- **Data Storage Software**

DOCUMENT MANAGEMENT — TAKE BACK CONTROL

Keeping track of documents is a tough job for most businesses. Document Management promises to help.

The natural state for many small businesses is near-chaos. Which is not necessarily a bad thing. Small businesses, after all, thrive on their flexibility and can-do attitude.

If near-chaos is the result of a business rushing to help its clients, then it is at least better than being a large, hidebound business in which forms have to be filled out in triplicate before it is possible to even contemplate how to start helping a customer!

The downside of that mix of chaos and flexibility can, however, often be an unfortunate tendency to reinvent the wheel.

It's understandable that this happens because when busy people in a dynamic small business are asked to achieve a task, their instincts say they should get to work and tackle the problem at the fastest possible speed. In their haste it is natural to rely on memory and experience, rather than pausing to think about intellectual property the small business may have already created that could make it easier and faster to do the job.

This tendency is promoted by the fact that small businesses seldom operate more than a file server. So even if a colleague tackled the same job last week, there's little chance to discover what kind of documents they created to do the job, or where they live.

The results of this inability to pause and understand how to preserve work properly are unpleasant. The failure to understand what intellectual property a business has already created takes away the chance to increase margins through re-using existing material. Ad-hoc storage — either physical or digital — impacts productivity by simply making it harder to find things.

Failing to inventory experience and intellectual property assets therefore leaves a business vulnerable when staff move on or are hit by the proverbial bus. It can also create regulatory problems.

HELP IS AT HAND

The antidote to all of these issues is known as Document Management, an umbrella term for a host of technologies that capture, organise, store and present information using structured processes so that a business knows what information it has created, can access it whenever required and can then make it available in moments using a variety of display techniques that suit the task at hand.

The starting point for a document management effort is a formal process for creating and storing information.

In their simplest forms, these processes can be expressed through a set of rules that states only certain document templates should be used, that the results should only ever be named using certain conventions and then saved into immutable folder structures that end-users cannot avoid as they create and save their work. These simple schemes make the information a business creates more predictable in its content and far easier to locate.

HP's ScanJet 7650

But while a simple document management process of this sort can be effective, its power is limited by the fact that few businesses rely only on digital documents that they created. Instead, most are awash with

incoming correspondence, faxes, email and the myriad commercial documents that inevitably arrive as an enterprise deals with suppliers and customers.

A good set of rules alone can't deal with all of those variables, which is where document management software comes in.

The power of this class of product comes from its ability to organise every document of every type an organisation creates or receives, and then offer management tools to ensure it is available as and when needed. Today's document management systems even link to storage hardware and software to implement the technique known as information lifecycle management, which ensures data is stored in the most appropriate and cost-effective ways.

MEET "BILL"

So how does document management work?

To understand the technique, consider a business which receives a bill in the post.

Many businesses would "file" the bill in an in-tray so that someone in accounts will enter it into financial management software. The bill would



be stamped as Due For Payment and eventually filed until someone throws it out.

Although, a business with document management software in place would behave very differently, as the arrival of the bill — and of any other paper document — would see it scanned using a high speed scanner like HP's ScanJet 7650. This machine can digitise 12 pages per minute at the small business-friendly price of \$1,099.

At this point two distinct processes commence, the first being the digitisation classification and routing of the document to ensure it reaches the right people in the right form.

This can be accomplished by simply using products like Nuance's PaperPort software which will drive the scanner, collect all the newly-digitised documents and create a searchable archive of documents. Software in this class can also transform a document by applying optical

character recognition to "read" it so it goes from the printed word into a digital document. The format of that document is your choice, with Adobe's portable document format and Microsoft Word both popular choices.

Weightier document management software like ELO's Digital Office (see breakout below) TOWER's TRIM, Microsoft's SharePoint, IBM's Domino or Xerox's DocuShare can also categorise a document at the same time it is scanned. This act is important because this class of software often includes workflow functionality so that the document is sent or made available to the person best-equipped to process it.

In the case of our hypothetical bill, an accounts receivable clerk would be alerted of the new document's existence by email. Integration between document management and financial management software could even mean that when the clerk opens the latter, the bill is there for them to see with all its contents transformed from information printed on paper into digital data.

If the clerk then authorises the bill for payment, document management software could even route it past his or her boss for final signoff and change its status to reflect the fact it has been processed.

Meanwhile, important steps are also taking place in the other process that commenced when the envelope was opened and the bill placed upon the scanner.

That second process was concerned with storing the newly-scanned image and involved some important decisions about the importance of accessing the bill for the business.

These decisions were important because when a bill arrives it is reasonable to assume that it will be read fairly often by people in a hurry to understand what it contains. Making sure the people who want to read the bill can do so therefore comes down to technical concerns about how to store it.

In the early days of a bill's life it is fair to assume that the best place to store it is on a fast disk, so that access is swift and easy. Good document management software will therefore integrate with storage management software to ensure this is the case. Doing so is very much the strategy informing EMC's range of products, which unashamedly



ELO's Digital Office

As an independent company, ELO Digital Office develops products and solutions in the areas of electronic document management and digital archiving. ELO Digital Office is sold through a comprehensive network of distributors, retailers and integration specialists.

Under the product name ELO — Electronic Leitz Organiser — document management and archiving solutions are offered to manufacturing companies, public authorities, hospitals, local councils, tax consultants, lawyers, auditors, the trade sector, service providers, administration, banks, insurance companies, publishing houses and more. ELO's product family range from an entry-level solution for small companies (ELOoffice) to

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merge management of documents and management of storage.

The reason why comes from the fact that disk drives' status as the fastest way to get a document in front of our hypothetical clerk's eyeballs comes at a price. Indeed, disk is the most expensive form of storage available.

A few days after our clerk has paid the bill, however, it may not make much sense to store it on disk. A month later when it will only be viewed as part of a quarterly consolidation, the few extra seconds needed to retrieve it from a slower disk won't be noticed. A year down the track when it is only ever accessed for data mining, slower disk again will suffice. And three years

into the future when the only reason to maintain it is compliance with government regulations, it can safely be shunted onto a tape because access times are no longer important.

This job of moving our hypothetical bill onto the most appropriate form of storage available is an important aspect of document management, and is the second process that starts when the paper hits the scanner.

But a third task is also critical, as it is all very well for the software to move the bill around between scanners and people, disks and tapes. For document management software to be truly useful, it must also provide a way for someone to search for any file of any type.

Even ten years after the bill has arrived,

good document management software will be able to tell its users where it is stored, just in case anyone ever goes looking!

Managing "the bill" is quite effortless with software like ELO Digital Office. ELO provides scalable software solutions that integrate into existing applications and infrastructures ensuring a positive return on investment. Worldwide there are over 600,000 users ranging from single users to large corporations.



ELO Office 7.0

What about chaos?

By this stage, however, you may be wondering just how being able to track a bill, push it through an organisation and store it at the lowest cost helps a small business keep a handle on things.

The answer lies in the fact that scanning is just one way to place a document into a management system. Some document management tools can work alongside the Save command in Microsoft Office so that it becomes impossible to create a file without it going straight into a document management database.

There it will sit alongside scanned documents and files from all sorts of other sources, even documents created as a result of speech recognition software analysing audio recordings. And like any other piece of information in a document management system, it will be classified so it can be found when needed.

For a small business the implication of this kind of categorisation and "forced

save" can be extraordinary, because whenever a team member creates a document they are forced to describe it. This makes documents far easier to find than would be the case if they were lurking around on a server's hard disk. A little training that reinforces the fact information is now far easier to find should see small business workers become far more likely to turn to the collection of files lodged in a document management system the next time they have a rush job.

The result should be a team working smarter as they re-use and refine tangible knowledge, instead of relying on intuition and experience. Best of all, the alliance with storage management software means this data will be securely stored and backed up, ensuring the investment in information preservation has the best possible chance of paying off.

End of the journey

All of the database, storage, workflow and scanning technology that goes into document management is, of course, little use if the end result is not something anyone can actually read! And reading is an important issue when it comes to documents that have been scanned. Modern computers have all sorts of tricks to ensure that text presented in software is as crisp and readable as possible. But those techniques do not apply to scanned text, which after all is just a picture of letters and numbers. Top quality monitors of 19" and up give your team the best chance to read scanned documents. NEC's recently released NEC NP1000G and NP2000G Digital Installation Projectors are another worthwhile accessory, as they provide the opportunity to beam high quality images onto a wall or screen so your whole team can join in the fun.

Great Ideas - Better Organised!

ELO
Digital Office

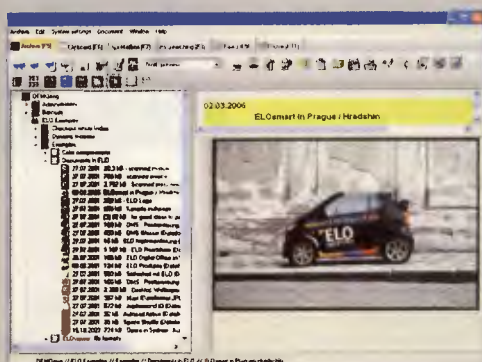
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Great Ideas - Better Organised!

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ELOoffice 7.0—Document Management & Archiving

Everybody knows how an archive works. Filing cabinets, folders and registers are familiar to all. ELO Digital Office has taken this tried and trusted method of organising documents and turned it into a modern electronic archiving system. Stand-alone or used in a network environment; ELOoffice 7.0 provides benefits to home, small offices or individual departments. Install and start!



Clear Overview of Documents

ELOoffice provides the user with a multi-media document management system, capable of managing files of various formats and sources in one central archive. Whether the archive contains Microsoft Office documents, picture files, videos, scanned documents or emails, ELOoffice 7.0 always provides a clear and structured overview



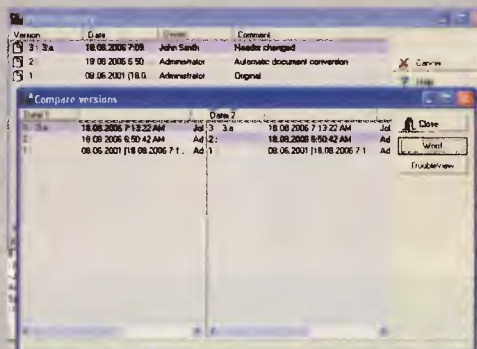
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ELOoffice 7.0—Highlights

- ⇒ Profile Administration allows the use of the local machine as well as the network archives
- ⇒ Separate fast Fulltext database for better search capabilities
- ⇒ Doubleview allows different doc versions to be displayed and compared side by side
- ⇒ Consistency test for database
- ⇒ Sounds like search



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Everyone!

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DOCUMENT CREATION AND PRESENTATION

Once documents are organised, they often need to be displayed. And it's in presentations, that Wacom's BizTablet comes into its own.

The Wacom BizTablet (RRP \$59.95) is a graphics tablet and cordless pen that provides a better alternative to a mouse, giving the user finer control and the ability to make handwritten notes into documents and presentations.

And with the two programmable function keys on the tablet and two programmable side-switches on the pen, users can set any shortcuts they prefer.

The power of BizTablet is that it gives you the ability to handwrite onto your document in real-time during a presentation. As your feedback is more rapid and dynamic during the presentation, the impact of your presentations is higher, and so is their retention by your audience.

BizTablet also works with a large number of business applications, including Microsoft PowerPoint, Excel

and Word, enabling you to annotate directly in them.

It also improves collaboration. Document reviews and annotations are made simple. If you use Adobe Acrobat 7.0 Professional, you can send an editable version of PDF files via email. When the recipients have Acrobat Reader 7.0 they can use the advanced collaboration tools to annotate your PDF file with BizTablet.

The Wacom BizTablet has a 1:1 screen-to-tablet ratio that allows you to move the pointer on the screen to the exact corresponding position in the active area. Together with the compact, business card size of the active area, this unique feature will give you faster movement and greater control of the pointer. Tap once to click, tap twice to double-click, tap and slide to highlight.

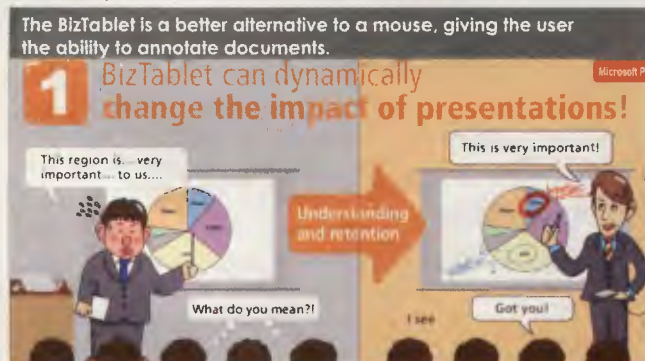
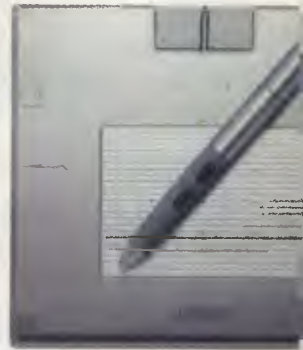
The BizTablet's lightweight, cordless pen is also battery-free. The problem with many other digital pens is that they are battery operated. This means that if your battery is weak or dead, then the pen will not work properly — a disaster when you're doing an important presentation.

Wacom's pressure sensitivity technology allows you to simulate

actual handwriting. Illustrators and photographers use pressure sensitivity to edit fine details on drawings and photographs. You can use it to create perfect signatures and indicate levels of importance when editing documents or emphasising points in presentations.

The BizTablet is also designed to be fully customisable. With the tablet driver software you can change the functions of the side-switches on the pen and the function keys on the tablet. The BizTablet offers 16 different functions for the two side-switches (including 7 different click functions, pressure hold and erase) and 13 functions for the function keys (including back and forward functions for enhanced web browsing).

And finally, using the BizTablet actually reduces the potential for repetitive stress injury. Those who have experienced repetitive stress injuries due to frequent mouse or trackpad use will fall in love with the feel of the pen. With an easy-to-hold rubber grip, the pen allows you to sit in a more natural position reducing repetitive stress.



The Ideal Tool To Enhance Any Digital Presentation

WACOM

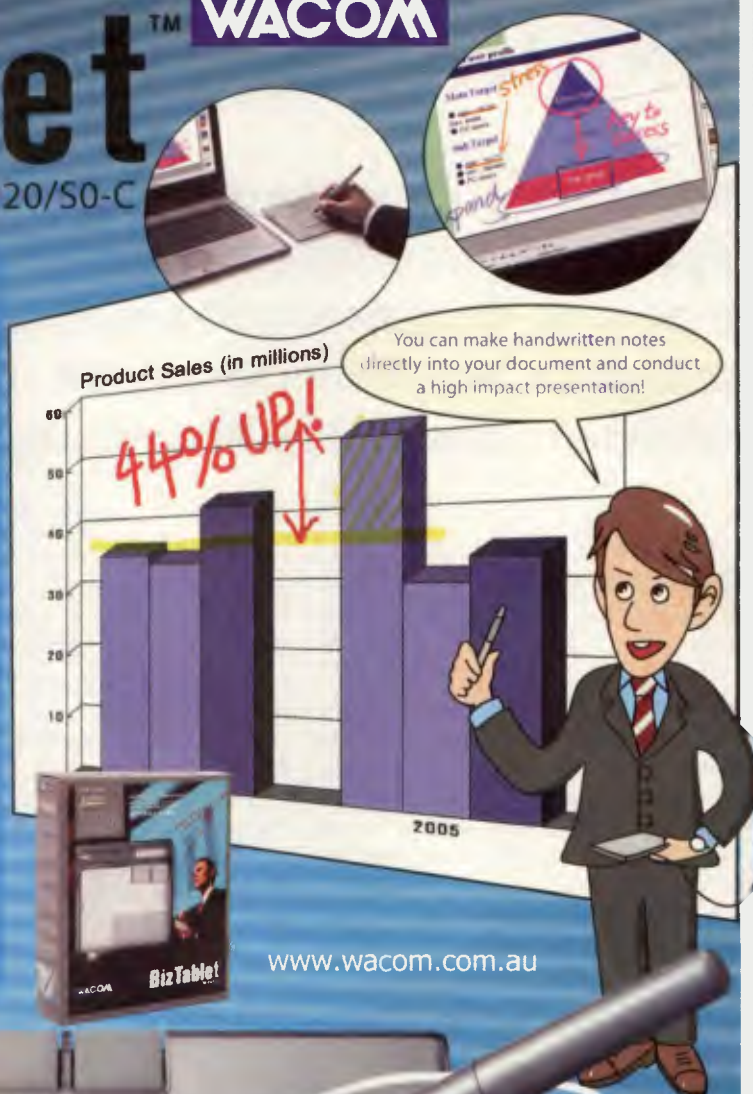
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MAKING YOUR MARK

The pervasive presence of the laser printer means that any business set on appearing professional must be able to despatch well-designed material created on a top notch printer. But which machine to consider? APC investigates.

Fuji Xerox Printers Phaser 8550
(RRP \$3,184.50), uses solid ink.



Cynics in the computer industry will tell you that the paperless office will arrive at about the same time as the paperless bathroom.

They're right, because even though email now makes paperless communication far easier than has ever previously been the case, there are still many occasions when printing a document is a necessary part of business life.

No two businesses are the same and any decision on whether an outright purchase or lease is the best way to go is therefore subjective.

But any decision will need to be informed by the metric of cost-per-page, the amount of money it costs you to print a page from your machines that can

be measured simply by calculating how many pages you will be able to print for the cost of ink or toner.

Do you want a printer to run without cartridges, mess or waste? It is then worth considering the solid ink technology created by Fuji Xerox Printers and used in printers like the Phaser 8500 \$2,194.50 (inc GST).

Fuji Xerox Printers Solid Ink printers use lightweight four-colour soy-and-wax solid ink blocks that look and feel like fat crayons that are non-toxic. They are simple to use and slot into the top of the printer where the ink melts, ready for quality printing.

The extra bonus is that there are no cartridges to dispose of and only one other consumable to take into account — a maintenance kit that that requires replacing only once

a year and takes less than one minute when that time comes.

If you need to take into account that your business may grow or you require implement changes, you won't need to discard the old printers and buy new ones. Solid Ink Printers have expandable features including extra paper trays, output trays, and additional postscript options.

It has taken Fuji Xerox Printers over 15 years of refined development to ensure that performance, speed, cost, reliability and quality will not be compromised.

In recent years printer-makers have grown their product lines to include multifunction machines. Photocopier specialists, likewise, have been happy to add printing functions to their wares. But printers and photocopiers employ important differences in technology to do their respective jobs, and relying on a company that makes great photocopiers as your main printer brings risk into the equation.

How to make a decision that cuts through these variables?



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Perhaps the best way to do so is to consider the role of printing in your business and a good place to start is to ask yourself how often you really need to print in colour.

If you also require cost effective, fast, volume printing and have minimal space, you'll do well to consider machines like the Brother 9420CN Multi-Function printer (RRP \$1,599) a 5-in-1 MFC with functions for printing, copying, faxing, scanning, and PC faxing.

Long-life consumables, upgradeable memory and paper capacity, takes into account that lowering the TCO is an essential part of any successful business.

Brother also provides another MFC that is worth a look at, the \$349 colour inkjet MFC-640CW, which can connect to wireless networks. This feature may seem incongruous at first, until you consider that the last thing your laptop-toting team members want to do on the rare days they visit the office is find a wired connection to the printer. This machine takes that worry away by allowing printing over a Wi-Fi connection, a very useful feature indeed!



Brother Colour inkJet
MFC-640CW \$349
Inc GST

Other more mainstream features you'll find useful include a web server built in to a printer, which again sounds odd but makes it possible to administer the printer using a web browser.

The more memory, the merrier too, as this helps a printer store more documents for you to reduce waiting times. A hard drive can be the ultimate upgrade in this space by adding gigabytes of capacity. You should also insist that your next printer can connect to your network, a feature now all-but standard but sometimes omitted. Whatever you chose, pay attention to your particular requirements and purchase from reputable vendors as mentioned in this feature. The right printer and MFC can make the difference in efficiency and cost of running a business.

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For definition please go to our website. [^]Australian Personal Computer Magazine - Best value: May, June, July 2006/Highly recommended: August 2006.

DATA STORAGE

Hardware and Software

Data can quickly fill hard disks. Storage is an important part of any document management system.



HP's ProLiant DL100 G2, a specialised file server running Windows Storage Server 2003 from HP.

Hanging on to important information is a real balancing act for a business. There's the issue of the cost of the storage hardware, plus the perennial concerns about its reliability, support and security. There's always the real danger of overcapitalising with hardware that isn't going to be used to its potential. On the other hand, hard disks filling up and work stopping is something that a business needs to avoid at all costs.

There are a number of options for adding secure, efficient storage to small and medium business networks. There's direct attached storage, network attached storage, storage area networks and good old hard disk drives. You also need to consider backup solutions using tape, hard disk drives or optical media, and then how your data gets on to the backup device.

If you've got a smaller network with a single Windows server, then going to tape backup can be expensive. It makes more sense to use a device like Maxtor's OneTouch II Small Business Edition. This is a USB attached 200GB external hard disk with Microsoft

Windows Server (including Small Business Server) support for direct to disk backup. It's a great simple solution from Maxtor, which has just been acquired by Seagate.

EMC's Restrospect Express HD Server Backup software is bundled with the drive, and will perform full server backups on schedule, or if you've made recent additions or changes you want to ensure will be saved — pressing a button on the Maxtor OneTouch II will also initiate a backup session. The setup for the Maxtor OneTouch III Small Business Edition is wizard-based, easy to get through and very quick to get up and running. The benefit in using this type of disk storage is its speed, as the OneTouch connects to the server with USB2.0, maintaining sustained transfers of 34MB/s. The portability lets you take the backup offsite and just think — no tapes to swap. Adding capacity to servers that have the room for more hard disk drives is quick and easy way to add more gigabytes. It's best to put some good thought in to the drives you choose. Though it's tempting to go for cheap slow SATA drives, you might regret the

sub par performance if you're moving a lot of data, or many small files.

The best alternative for adding disks that will perform up to high expectations is Seagate's Barracuda ES range of hard disk drives. The Barracudas run at 7200 RPM and are available with both 8MB or 16MB of cache for enough throughput to keep things running smoothly. There's support for Native Command Queuing with compatible SATA chipsets, and the Barracudas are, most importantly, rated for 24/7 operation. The new range of Barracuda hard disk drives use perpendicular recording technology for an improved data density, with models available with capacity of 250GB, 400GB, 500GB and a huge 750GB. The Barracuda range is perfect for rich media storage (like video, audio and images), large databases, email servers and file servers.

Adding "dumb" storage via NAS (Network Attached Storage) can be a minefield. When users begin storing unnecessary or redundant data on NAS devices that can't be easily monitored it's a waste of money. Running an active

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server as a file server can tax resources for databases, email or hosted services, adding further stress to often overworked solutions. The ideal way to deal with that is to incorporate a specialised file server running Windows Storage Server 2003 from HP. HP's ProLiant DL100 G2 is such a system; it offers capacities of up to 2TB in four 500GB SATA disks in only 1 rack unit of space.

Running Windows Storage Server on the file server lets you specify exactly who and what can be stored on the disks. As it's a complete Windows Server OS, it fully supports Active Directory, distributed file systems and doubles as a print server, taking up more of the slack. It can be remotely administered and offers full reporting on storage usage. The ProLiant DL100 G2 is preconfigured with Windows Storage

Server 2003, and can be run right out of the box.

Once stored, database management is essential to a business and The Australian Software Company's synchronisation solution, SQL Delta, makes keeping multiple copies of the same database easy. Now the days of comparing and writing script can be reduced to just minutes and even the scripting errors are consigned to the past. No longer is there a need to run that final change script on production with fingers crossed. SQL Delta is a database comparison tool that searches and uncovers every difference between a development and production database in no time at all. Then with just a few clicks a change script is created and executed resulting in a production database that is accurately synchronised with no production downtime.

DATA STORAGE – SOFTWARE

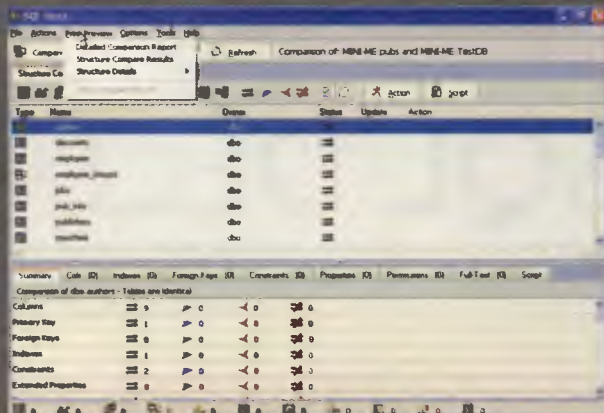
SQL Delta is an easy to use, fast database compare and synchronisation tool for comparing database structures (schemas) as well as comparing the data held in the databases. Simply choose the source and target database, click compare and SQL Delta displays all differences between the two schemas. SQL Delta can then generate an update SQL script for saving or immediate execution. Use the data compare module for highlighting data differences in selected tables. You can apply filters to the data

prior to compare or just compare all. Then synchronise the data differences with only a few mouse clicks.

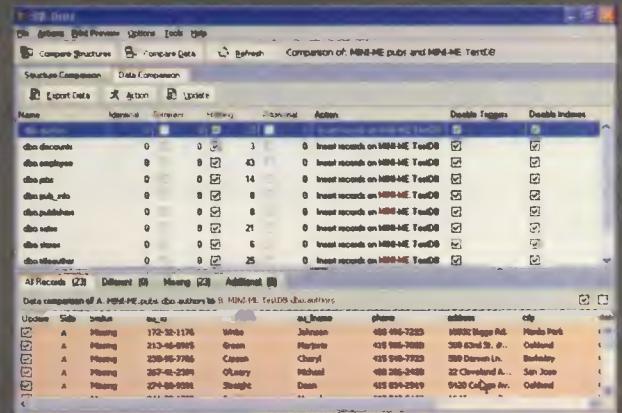
SQL Delta can run unattended by reading an XML script file to automatically compare and synchronise the schema or data. You can even have the different scripts or reports emailed directly to you.

For anyone who works with databases SQL Delta is definitely a great time saver and one of those must have tools.

Go to www.sqldelta.com to download your free trial.



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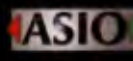
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